# The Builder.

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## *The Royal Commission on London Water Supply.*

THE Report of the "Royal Commission on the Water Supply of the Metropolis" is now before the public. The accounts which have appeared in the daily papers appear to have been derived merely from a *résumé* of the proceedings supplied in advance to the Parliamentary Press, and do not give any basis for a full consideration of the subject; and, in fact, such consideration can only be based properly on the full evidence taken before the Commission, which is not yet printed, and may not be for some time to come. Our own reports of the proceedings before the Commission, carried on continuously from the first sitting of the Commission, furnish, however, a pretty full account of the main purport of this evidence.

We cannot regard the Report as at all a satisfactory result from the appointment of a Royal Commission to consider a subject of such great extent and of such vital importance to London. When it was first known that a Commission had been appointed to consider the subject, it was generally expected that the possible sources of water supply for London would be considered on the widest possible basis, and that the proper object of such a Commission should have been to take evidence as to all the sources of water supply for London which could be regarded as within practicable reach. Instead of this, the Commission was restricted at the outset to an inquiry limited according to the following formula, which forms the first paragraph in the report of the Commission:—

"Whether, taking into consideration the growth of the population of the Metropolis and the districts within the limits of the Metropolitan water companies, and also the needs of the localities not supplied by any Metropolitan company, but within the watersheds of the Thames and the Lea, the present sources of supply of these companies are adequate in quantity and quality, and, if inadequate, whether such supply as may be required can be obtained within the watersheds referred to, having due regard to the claims of the districts outside the Metropolis, but within those watersheds, or will have to be obtained outside the watersheds of the Thames and the Lea."

The Commission was thus formally debarred from taking any account of what appears to us to be the most important question of all, viz., whether there is any adequate available source of supply to be found, within practicable distance of London, which would afford a sufficient supply entirely apart from the necessity of depending on the abstraction of water from the Thames. It was on this point, above all others, that we wished to have evidence; and this is entirely thrown on one side by the very conditions under which the Commission has been appointed. It will probably be many years before another Royal Commission is appointed to consider the subject, and thus we have been debarred, for an indefinite period, from obtaining the very evidence which is most of all to be desired.

One result of this restriction has been that the report of the Commission has practically taken what may be called a semi-political aspect. The ambition of the London County Council, rightly or wrongly, has been to formulate a new and independent scheme for London water supply; to buy up the London water companies, and to undertake officially the supply of water to the Metropolis. Being debarred by the conditions of its appointment from taking any such scheme under consideration, the Commission has almost insensibly become a kind of anti-London-County-Council enquiry. It has had to justify its position by showing that the schemes of the County Council were unnecessary and visionary. The bulk of the evidence tendered has been manifestly shaped in the interests of the London water companies, in reality if not ostensibly; and what ought to have been a local and impartial enquiry into all possible sources of water supply for London has been insensibly narrowed into an advocacy of the *status quo*. Witnesses representing more or less the interests of the existing water companies have had ample opportunity of making a case for themselves, and have furnished the bulk of the evidence. No doubt a good deal that is of practical value has been elicited; but the net result of the long and costly labours of the Commission is that we are left pretty much where we were. We are assured that there is no harm to be apprehended, either to ourselves or to the river, from going on drinking up the Thames for another half-century or so (which we admit is as long a period as any Commission can reasonably be expected to deal with), and that in fact we are a great deal better off in the way of water supply than we had any idea of.

This is a consolatory conclusion, if true; and in some respects we believe it is true. We concur, for instance, in the opinion expressed in the Report that the quality of water at present supplied to London is for the most part very good. The impassioned denunciations of it which we have heard delivered, *ore rotundo*, at County Council meetings, were much exaggerated, and were obviously the deliverances either of people who were speaking on hearsay and with very little practical knowledge of the subject, or who had a policy to serve. In this latter respect they were just in the same boat with many of the witnesses before the Commission; it is six of one and half a dozen of the other. The quality of the water is good because great, and we believe conscientious, pains are taken by the companies to render it so by adequate filtering. But this is a constant struggle against adverse circumstances. Our opinion remains the same—that an open river flowing through a populated country is not an ideal source to draw drinking-water from; and that to continuously and increasingly deplete a running river for water supply is to spoil one of the greatest sources of beauty and health for the country through which it flows. The contrary idea is a superstition which we believe must give way in the long run. It was long considered that a running river was a naturally provided drain to carry away sewage. It took many years and much fighting to put down that superstition, which in many districts is rampant yet, so far as the law will allow it to be so. It is now the popular superstition that an open river is meant to furnish drinking-water. We look to a time when that superstition will be exploded also.

We should have been glad to find that the Report of the Royal Commission had done something to assist in exploding it. But the Commission in this sense is a Balaam. We looked to them to curse the river—as a drinking-cup; and behold, they have blessed it altogether.

However, in endeavouring to estimate what value there is in the Report of the Commissioners, we must for a moment adopt their standpoint and take them on their own ground. Having been commissioned to enquire into the sources of water supply for the Metropolis within the watersheds of the Thames and Lea, obviously the first thing to be done was to stake out the ground implied by the term "Metropolis," and the Commissioners eventually decided to adopt as a basis the City and Metropolitan Police District, which covers an area of 701 square miles, and may roughly be described as being comprised within a circle drawn round Charing-cross as a centre, with a radius of 15 miles. To this area certain outlying parts were also added as coming under the influence of London water companies.

The population within the City and Metropolitan Districts (Greater London), as found by the census of 1891, was 5,633,332; in 40 years the population had more than doubled itself. The Commission set itself the task of estimating the population of the same area 40 years hence, for that was the interpretation placed upon the "future" implied in the charge. It was very clearly shown that the population did not increase in the same ratio during the decennial period ending 1891, as in preceding periods; the question to be solved was whether the decrease was due to accidental fluctuation, or was to be taken as a sign that for the future the growth could not be estimated by analogy with previous periods. The conclusion arrived at was that the tendency of the rate of increase to diminish had not as yet been shown for a sufficiently long period to justify the adoption of it as a basis for estimation; and it was assumed, therefore, that the rate of increase in population during the next forty years might be based on that of the last decennial period, namely 1·68458 per cent. annually. Thus in the year 1931, according to this computation, greater London will be inhabited by 11,035,289 people—nearly double the present number.

We think that this estimate is, in reality, too high; the fact that the increase per cent. in population during 1881-1891 was only 18·2 as compared with 22·7 in 1871-1881, 20·6 in 1861-1871, 20·2 in 1851-1861, and 19·9 in 1841-1851, is surely not without significance. At the recent meeting of the British Association Mr. E. Cannan, of Oxford, showed that the net immigration into London in the last ten years was only 56 per cent. of what it was in the previous ten years, and only 63 per cent. of what it was thirty years before; the result of his observations was to show that there was a diminution of the net immigration from the country into large towns, and that, contrary to the general belief, the excess of immigrants over emigrants was rapidly diminishing, and seems likely to disappear before the end of the century. Assuming this to actually take place, though we are not altogether prepared to endorse the last statement, the only increase in the population of London would be by excess of births over deaths. In other words, there are good grounds for believing that the rate of increase during the present and future decennial periods will not be so high as during 1881-1891—the period on which the Commissioners have computed their figures. However, by taking the higher ratio, they, no doubt, acted wisely from the point of view of their inquiry, even though the figures are delusive, and led to more work in finding the necessary quantity of water.

The next important step was to ascertain the quantity at present supplied per head of population. The following table, relating to the year 1891, shows this in a condensed form:—

| Name of Company. | 1. Net Supply per Diem. | 2. Population. | 3. Net Supply per head per diem |
|---|---|---|---|
| | Gallons. | | Gallons. |
| 1. New River | 32,640,976 | 1,159,260 | 28·16 |
| 2. East London | 39,704,601 | 1,158,500 | 34·27 |
| 3. Chelsea | 9,557,388 | 287,362 | 33·25 |
| 4. West Middlesex | 15,419,907 | 577,[illegible]5 | 26·71 |
| 5. Grand Junction | 16,701,734 | 350,000 | 47·72 |
| 6. Lambeth | 20,234,560 | 655,921 | 30·85 |
| 7. Southwark and Vauxhall | 24,373,348 | 841,989 | 28·94 |
| 8. Kent | 12,530,871 | 462,524 | 27·21 |
| | 171,163,385 | 5,490,791 | 31·19 |

The figures in column 2, it must be remembered, were largely based on information supplied by the water companies. Their usual method of arriving at these results was to ascertain from their books the number of their separate supply pipes, and, assuming that each such pipe supplies one household, to multiply the number of households, so assumed, by a factor representing the probable average number of persons resident in one house, as derived from the latest census returns. The Commissioners, however, soon became aware of the fact that the number of separate supplies was not equivalent to the number of houses supplied, and that the method of computation adopted was somewhat illusory. They also found on comparison that the water companies' estimate of the population in their area of supply exceeded the true number as ascertained in Greater London by the 1891 census. They therefore instituted an independent enquiry, based on the known population of the various parishes supplied, with the result that the total number came out at 5,237,062 persons. The only source of error in this calculation, they state, arises from the utilisation of water from private wells, &c., which they are inclined to believe is infinitesimal as compared with the whole.

For our own part we feel confident that a large number of persons are supplied with water from private sources; we have only to glance at the number of wells in the Metropolitan area daily being drawn from, to be convinced of this. It is perfectly true that the greater quantity of water thus derived is used for trade purposes, but at the same time it would not be difficult to specify a number of establishments where private wells are to-day giving out the only water consumed by a not insignificant population. We are therefore much surprised that the Commissioners should allude to the fact slightingly. They say it is not possible to ascertain exactly the number of persons obtaining water from private sources, and therefore assume the whole 5,237,062 persons as the closest approximation that can under the circumstances be made. It is probable that this figure is a good deal in excess of the real number supplied, and forms an erroneous standard of comparison. Outside the parliamentary districts of the Metropolitan water companies and wholly or partly within the area of Greater London are a number of smaller companies and local authorities supplying water, but the Commissioners were unable to obtain very precise data respecting them, either as to the population served or the quantity delivered. From figures furnished by some, however, they base the present daily average thus supplied at 10,000,000 gallons.

Then, again, there seems to have been some doubt as to the actual quantity of water supplied by the eight large Metropolitan companies per day; the average amount returned to the Water Examiner under the Metropolis Water Act, 1871, not being quite in agreement with the figures furnished to the Commission by the companies. The difference was not a great one, and having regard to the circumstance that absolute accuracy could not be obtained so long as the quantity of water pumped was calculated from the number of strokes made by the engines taken in connexion with the capacity of the pumps, they agreed to shelve the discrepancy. Such a method is, of course, vitiated by the unavoidable want of perfect tightness in the pump-valves, and by the failure of the non-rotary engines employed to maintain a uniform length of stroke.

Recognising the great value of having an independent opinion respecting the quantity of water supplied, however, they charged their Assistant Commissioner to investigate the question personally, and he arrived at the total amount stated in the first column of the foregoing table, viz., 171,163,385 gals. per day, which, calculating from the estimated population served, as stated by the water companies, gives an average consumption of 31·19 gals. per head per day, as shown in the third column. It will be observed that the supply per head varies considerably in different districts, ranging from 47·72 gals. in the Grand Junction Company's to 26·71 in that of the West Middlesex Company. It was indicated in the evidence that the high figure of the first-mentioned company was largely due to waste; it was found cheaper to pump up the water than to supervise and control the waste of water supplied. This may seem at first sight a very immoral state of things, and no doubt a reasonable amount of control ought to be exercised over the consumers; but on the other hand it must be urged that, except air, there is no element of which copiousness of supply is so desirable as of water; and there can be no doubt that the powers which the law gives to the water companies in the way of interference with consumers and their fittings are in reality far more drastic than they ought to be, and are abused by some of the companies in a most unreasonable manner, amounting to a petty persecution of a most irritating and often unnecessary nature. On this head we may have some facts to give on another occasion which will fully bear out this comment, but we cannot go into that at present. To proceed: deducting the quantity of water estimated to be used for trade purposes it was found that about 25 gals. per head per day was the average amount delivered by the whole of the companies. If we adopt the Commissioners' computation of the population served, viz., 5,237,062, we arrive at an average consumption, for trade and domestic purposes, taken together, of 32·68 gals. per head per day.

The main question before the Commission now stood as follows:—Can a sufficient supply of water (having regard to the foregoing statistics) of sufficiently good quality be obtained from the Thames and Lea valleys for the use of 11¼ millions of persons without serious prejudice to the other inhabitants of those valleys? To answer this, as a preliminary, the geological structure and hydrological features of the two valleys were considered. It was pointed out that since the publication of the Report of the Duke of Richmond's Commission much new information had been gathered respecting the superficial deposits which so materially affect the descent of water underground, and special attention was therefore directed to these. In an enquiry of this nature it is of great importance to distinguish between the older formations out of which the valleys had been carved, and the newer deposits, for the most part only a few feet in thickness and spread irregularly over the surface. These superficial layers of sand, gravel, loam, clay, &c., conceal the rocks below, and more or less interfere with the access of water to them from above. A copy of the Geological Survey Map of the basins of the Thames and Lea, on the scale of 1 in. to a mile, was prepared for the Commissioners, from which it was seen that the older rocks in the region may be grouped in three great series—1st. The Jurassic formations; 2nd. The Cretaceous formations; and 3rd. The Tertiary formations. The first of these series is not found at the surface in the basin of the Lea.

Dealing first with the Thames basin, it is

conveniently divisible into three parts, each of which coincides with the area of one of the groups of formations just mentioned. The river has its sources in Jurassic strata; between Abingdon and Windsor it flows over Cretaceous beds, and below the last-mentioned place its course lies across the Tertiary formations to London. The superficial deposits in the basin occur as sheets and detached patches scattered over the older rocks; not only in the bottom of the valleys, but stretching a long way up their sides, even up to the tops of the watersheds. For the purposes of the inquiry the basin was divided into two parts—(1) that portion above the intakes of the water companies, and (2) the portion below them. Dealing with the first of these, with a total area of 3,548 square miles, we find that some of the older rocks exposed at the surface are readily permeable by rain-water, others are impermeable, and a third partially pervious. In the Jurassic part of the basin an area of 537 square miles is composed of pervious strata, 616 of impervious, and 169 of partially pervious. We need not discuss this section of the inquiry; suffice it to say the Commissioners arrived at the conclusion that no addition to the present water supply of London is to be obtained by any operations conducted in the upper or Jurassic part of the Thames basin.

The rocks of the Cretaceous system occupy 1,420 sq. miles in the basin above the intakes, of which about 1,243 sq. miles are pervious, and 177 sq. miles impervious. The upper member of this system, the Chalk, is by far the most important source of water supply in the south of England.

Of the Tertiary formations in the basin above the points of intake, 161 sq. miles are pervious, 366 impervious, and 279 of an intermediate character.

We cannot help noticing that whilst some pains are taken to estimate the areas occupied by the divers strata, classifying them according to their degree of porosity, no serious practical use is made subsequently of this information. It is one thing to estimate the amount of water absorbed on the basis of the percolation of a certain percentage of the rainfall; and quite another thing to arrive at any satisfactory conclusion as to what becomes of the water which has percolated. Some of it comes to the surface again, whilst a large quantity is retained in the rocks, but a considerable amount must be lost altogether by percolation into other areas outside the basin, for the geological structure of the ground bears very little relation to the watersheds in this case. Whilst, therefore, a great parade has been made as to the geology of the Upper Thames area, with especial reference to the porosity of the rocks concerned, we cannot see that it has led to much practical result—the question has not yet been sufficiently studied. The same may be said concerning the superficial deposits; they are scattered so irregularly over the older formations that it is difficult to make satisfactory estimates of their respective areas, except upon the basis of detailed surveys; but these surveys have been completed for only a portion of the district in question, so that much of the information on this head is mere guess-work.

The report states that the basin of the Lea resembles that of the Thames below Abingdon in geological structure, but with this important difference, that its sources rise within the Chalk and Tertiary districts, and are not increased by the influx of water from any older group of rocks, and with this further distinction that the Cretaceous area of the basin lies on the chalk and does not include the outcrop of any of the older members of the Cretaceous system.

Turning to the consideration of the present sources whence the Metropolitan companies derive their water we find they are four in number, viz.:—(1) the river Thames and the Lea; (2) gravel beds adjoining the main stream of the Thames, and other gravel beds at Hanworth; (3) natural springs; and, lastly (4) wells sunk into the chalk or other strata. All the companies, except the Kent, are dependent for some part of their supply upon water derived from the two rivers mentioned. The New River and East London Companies take 22,500,000 gals. and 33,000,000 gals. respectively per day from the Lea; and, in addition, the latter company may take 10,000,000 gals. per day from the Thames. The remaining five companies derive their main supplies from the Thames, and have statutory powers to obtain 20,000,000 gals. each per day from the river. In 1886, however, an agreement was entered into between them and the Conservators whereby, on payment of a sum of money to the latter, a total of 20,000,000 gals. daily was allowed to be abstracted in excess of the amount already stated; and the excess was divided amongst the companies, each being allotted 4,500,000 gallons, except Chelsea, which was only allowed 2,000,000 gallons. Hence the curious and (to a cynical mind) amusing spectacle, in the evidence given before the Commission, of the Thames Conservancy, which we might expect would be specially anxious to keep as much water as possible in the river and preserve it in its best condition as a river, giving all their evidence in favour of the companies; asserting that the extraction of so much water from the Thames did not injure it in the least as a river; that much more might be taken without injury; and in fact all but committing themselves to the position that the more the water companies took out of the river the better it would be. The water companies are the Conservancy's best paymasters; in fact, the only source through which the Conservancy can make both ends meet; and it is not in human nature that it should denounce those who fill its pockets; but this is certainly, as we have before observed, a most original way of "conserving" the Thames. There seems, however, to be some doubt as to the legality of the withdrawal of this excess amount from the Thames; it looks very much like an evasion on the water companies' part of their Acts; but at any rate they believe that they are now empowered to take 120 million gallons, which, added to the 10 million gallons allowed to the East London company, makes up a total of 130 million gallons, which is the volume authorised to be drawn from the river at the present time by the Metropolitan companies for the supply of London.

Some of the companies, however, are very smart and have devised methods whereby even this quantity may be exceeded, as occasion may require, without having the trouble to go to Parliament for further powers. There are immense beds of gravel on the lands in close proximity to the river, and from these the Lambeth, Grand Junction, Southwark and Vauxhall, and East London Companies obtain large quantities of water, one company alone stating that it could get seven to eight million gallons a day from this source. The companies believe that water thus obtained has nothing to do with the statutory amounts allowed from the river, inasmuch as it is derived from wells sunk in the gravel, but the Commissioners very properly point out that if the water in the gravel beds were left entirely uninterfered with, it would gravitate to the river at its natural outlet, so that it is clear that the companies are not justified in claiming that the gravel supplies should not be counted as part of their authorised amounts.

We will not go into the details of the schemes proposed by the water companies to augment their present supplies; the following summary sufficiently states their views:—

| | *Gallons per day.* Millions. |
|---|---|
| From the Thames with additional storage | 300 |
| From the Lea, with East London Company's projected storage | 52½ |
| From chalk springs and wells | 87 |
| | 439½ |

In order to arrive at this amount the companies have suggested:—

(1.) The abstraction of more water from the Thames without providing extra storage.
(2.) Ditto, from the Thames and Lea, with provision for storage.
(3.) Ditto, from gravel beds adjoining the Thames.
(4.) Ditto, from deep wells in the chalk.

With reference to the first point, we find engineers of known standing recommend the simple solution of abstracting more water from the Thames without any storage; and it is argued that as the intakes of the principal water companies are situated between Sunbury and Molesey Locks, 200 millions more might be abstracted without making any appreciable difference in the state of the river, as the water is kept practically at a constant height by the Molesey Weir. So that we presume the argument runs thus: that when you have a certain amount of water distributed in a series of troughs one below an other, if you pump water from the lowest trough and it is filled from the upper ones, you have not really taken anything out.

The proposal for storage reservoirs is a more practical matter, though some of the proposals of this kind brought before the Commission would not (in a double sense) hold water. A scheme was brought forward by Professor Henry Robinson to augment the present supply from the Thames by the construction of three impounding reservoirs in the Kennet valley; but it was found that the data upon which the scheme rested were unreliable, both in respect of the volume of water that could be collected from the watershed and of the water-tightness of the reservoir sites. A second scheme of storage was submitted by Messrs. Marten & Rofe on behalf of the Thames Conservators, and consisted of nine reservoirs to be constructed upon various tributaries of the upper Thames, and this was backed up by a number of scientific experts, though the whole of these reservoirs did not receive the unqualified approval even of the witnesses called for their promotion. Some of the selected reservoir sites were very bad, from a geological point of view, and the Commissioners dismissed the scheme on that and other politic grounds.

The third proposal was much more practicable than the other two; it was brought out by Messrs. Hunter & Fraser, of the Grand Junction Company, and consisted in the construction of nine reservoirs upon land in the neighbourhood of Staines, at only a few miles' distance above the existing works of the companies. In this scheme it was not proposed to dam up natural valleys; the storage capacity would be obtained by excavating below the surface in almost flat ground, and forming the material removed into banks so as to increase the depth. In this way a depth of 40 ft. would be obtained, the digging being entirely in gravel, which overlies the clay to a depth of from 20 to 30 ft.

There can be no question as to the suitability of the sites for the purpose; probably no one would dispute that. From a geological point of view, the bottom of the reservoirs, being formed of clay of great thickness, would be perfectly watertight; and the scheme has the additional advantage of being capable of being carried out in parts as occasion may require.

This storage reservoir scheme is the most satisfactory item in the proceedings of the Commission; since, if no effort is to be made to find any main source of water except out of the Thames, the storage system at least affords a chance of getting it without depleting the river much more than at present. That there is enough water in the river to supply London for a long time to come we do not question, but if the system of pumping out more and more as demands increase is once accepted, the demands will go on increasing, and the public in twenty years' time will begin to find out the mistake to their cost. The Commissioners make a point of the statement, at the conclusion of the Report, that as the average daily flow of the Thames at Teddington Weir, adding to it the amount abstracted by the water

companies, is about 1,350 million gallons, the companies might go on abstracting up to 350 millions daily, and still leave 1,000 million gallons to go down the river. It seems to be thought that 1,000 million gallons is a good round sum which ought to content anyone, and that as the water companies would not in that case be taking away much more than one quarter of the river water, there would be little to complain of. We should reply that one quarter of the water is a very large proportion to take out of a river, and such an abstraction would make all the difference between a full flowing river and a low and sluggish one; and we doubt very much whether the Commissioners, dealing with the matter merely as an abstract question of figures, have at all realised what is likely to be the practical effect of their proposals in spoiling the river, as a river; that is to say, as an important element of beauty and enjoyment for the neighbourhood of London. The proposed reservoirs, of course, would be a disfigurement of the country to some extent; but the Staines neighbourhood, the only site which has been admitted as a practical one for such reservoirs, is a flat and not particularly picturesque piece of country, and we do not know that it would suffer very much. We would certainly rather see the reservoirs than have the Thames spoiled, and spoiled it will be if it is to remain as the drinking-water conduit for London. For it must be remembered that the demand per head for water is almost certain to be an increasing, not a diminishing one. The evidence of some eminent engineers in regard to amount of water supply was given before the Commissioners, to show that the present rate of supply could be and ought to be diminished. The New River Company, Sir F. Bramwell said, would have to reduce their supply per head from the present 28½ gallons to 26 gallons, and so on of other companies, and that there was no reason why water for domestic purposes should not be reduced to 20 gallons a head, and Mr. Hawksley gave similar evidence. *In whose interests was this evidence tendered?* Mr. Hawksley very frankly said that he came there because he had received a retainer on behalf of the water companies, and they insisted on his appearing; and we presume that Sir F. Bramwell's appearance was on much the same grounds. These gentlemen seem to represent what may be called the antediluvian days of water consumption. One of the first medical men in London laid it down, in our hearing, that every healthy and cleanly person "should get *into* water every morning," *i.e.*, should have a full bath to plunge under in; and this excellent habit is being adopted increasingly, and will be more so in the future generation. How far will the 20 gals. a day* go towards that, with all the other necessary household purposes? We do not want to know how *little* water we can do with; there are plenty of persons competent to work out that problem for themselves, but they are not the class of people whose ideas on sanitation and civilisation are usually considered of the first importance: we want to know how *much* we can have; and the suggestions of these expert witnesses for a further reduction of supply—suggestions made obviously in the commercial interests of the water companies—are an absolute mockery of the object, or what ought to have been the object, of the Commission. We are for the moment leaving on one side the question of danger to health from drawing water out of open rivers flowing through populated districts; the danger has perhaps been exaggerated by medical experts, but the rebutting evidence given before the Commission does not persuade us that this danger does not exist. But however that may be, it is certain that London above all other cities wants an ample supply of water; the ideas of the majority of people as to what is meant by an ample supply are certain to extend rather than contract as years go on; and above all things we desire that the supply of an element which is a necessary of life should be taken from the hands of trading companies, which administer it for the benefit of their own shareholders, and be administered for the public benefit solely. And a Royal Commission which leaves us for ever in the hands of these trading companies; which proposes even to give them increased powers of control; which tells us that, if we are very careful, we can manage with so much (or so little) water as a maximum limit, provided we do not mind spoiling our river by perpetually increasing extraction of water from it, might almost as well not have sat at all.

* The proposal for 25 or 26 gals. per head made by Mr. Hawksley and Sir F. Bramwell means about 20 gals. per head for domestic use, and the remainder for use in manufactures, &c., by meter supply.

## NOTES.

THE speech of Mr. Fowler, the President of the Local Government Board, at the end of last week, on the occasion of the presentation of his portrait by the town of Wolverhampton, was one which should not go unobserved. In a word, it showed the great progress, moral and material, made by this country during the present century. Mr. Fowler regarded, and no doubt rightly, the successive diminution in deaths on each occasion of an invasion of cholera, as showing the improvement which has taken place in the health of the community. In 1849, the number of deaths was 52,000; in 1854, it was 22,000; and in 1866, it had sunk to 18,000; and this diminution in numbers corresponded with an actual increase in the population and with more careful registration. Again, Mr. Fowler pointed out that "in 1818 we spent seven and a-half milllions on the relief of the poor, and in 1892, with a population of nearly thirty millions, the amount was only eight and a-half millions, whilst the poor were thoroughly well relieved." Again, out of a local debt in England of two hundred millions, twenty millions had been incurred for sewerage, six for free libraries, parks, and baths, five for artisans' dwellings, and twenty-nine for public improvements. The balance was incurred for lighting, schools, markets, and so forth. Mr. Fowler asked, for what had the local debt been incurred? and he duly answered, "for the happiness and improvement of the people; for fighting the battle against ignorance, vice, disease, and misery; and for elevating the whole community." It has been money well spent; from time to time—as is natural—mistakes have been made, but on the whole there cannot be a doubt that this expenditure has enormously improved the physical and mental health of the people, and has largely increased the aggregate happiness of the community.

THE nationalisation of mines, as of railways, is the pet dream of many a perplexed student of the ever-recurring and difficult problems presented by such contests as the coal dispute; and from the data made available by the publication of Sir George Elliott's scheme for a gigantic Coal Trust they will have ample material to work on from their point of view, and a good opportunity for airing rival projects. The *Times* of Wednesday in last week devoted three or four columns to the details of Sir George Elliott's colossal scheme, in which the lessee, the labourer, and the consumer are invited to amalgamate their respective interests in the entire coal deposit of this country. As usual in such schemes, each party to the bargain is promised substantial and attractive advantages—the first, in this case, of economies in working and administration which, it is claimed, would result from a more systematic development of the coal deposits. It is a great co-operative scheme, quite distinct in its conception from the more familiar forms of trusts and syndicates; embodying much that is sound, theoretically, if impracticable. The magnitude of the operation does not seem to have greatly impressed the originator, although he computes that the capitalised interest of the lessees would amount to 110,000,000*l.* We imagine, however, that the Board of Trade would be very strongly impressed with the part assigned to them by the scheme—which amounts to nothing less than the safeguarding of the interests of all concerned, by being entrusted with power to regulate very largely both the price of the coal and the amount of profit. The apportionment of the latter is elaborately set forth—the purchaser to come in for a share (in the form of discount)—but only after interest and a sufficiently large dividend have been provided for. The general comment on this feature of the scheme is, that the prospective benefit to the consumer is altogether of the "deferred" order, while the *Economist*, speaking of the proposal from other points of view, pronounces it to be utterly impracticable and Utopian.

BY the death of Mr. Thomas Hawksley, F.R.S., at his residence in Kensington last Saturday, the profession has lost one of the most distinguished engineers who have been deemed experts in the construction of gasworks and waterworks. Mr. Hawksley was elected a member of the Institution of Civil Engineers, April 7, 1840, and subsequently became its President. Large boroughs, especially where pumping machinery was employed for raising water, consulted Mr. Hawksley, but his details were never so popularly known as in the case of other engineers' designs, because he never sought publicity beyond the approval of those by whom he was instructed. Probably fewer of Mr. Hawksley's drawings have been published in the professional press than those of his competitors. To him is attributed the introduction of constant service in water-supply, a very important improvement in a sanitary sense, as leading to abolition or great reduction of storage cisterns, so often the occasion or opportunity of water contamination. He was also an authority on sewerage schemes where pumping was necessary to be introduced, and evinced at all times an interest in sanitation. In 1868, he was a valuable witness before the Royal Commission on Water Supply, known as the Duke of Richmond's Commission. In 1883, he appeared similarly before another Commission appointed to deal with the purification of the River Thames, and, so recently as 1892, was again examined upon the Metropolitan Water Commission, which has just issued its Report. His opinions before Parliamentary Committees were always respected and his estimates trusted. In 1887, when he was at the age of eighty, several friends in the legal and engineering professions subscribed and presented him with his portrait, which, being an excellent likeness painted by Mr. Herkomer, will remain an heir-loom in the family. His son is already a well-known member of the Council of the Institution of Civil Engineers, and has had a bright example of honesty, skilful application, and consequent success presented to him in the career of a father who was permitted to attain the ripe age of eighty-six years.

THE death of so gifted a painter as Mr. Albert Moore, at the comparatively early age of 52, will leave a notable gap in our annual exhibitions of painting, both at the Academy and elsewhere. Mr. Moore's range was limited, but within it he stood quite alone, and represented an element in contemporary painting which no one can replace. His pictures represented the charm of female form—sometimes nude, oftener draped, but draped so as to give full importance to the lines of the figure—combined with an exquisite and delicate harmony of colour in the draperies and

accessories. His pictures, which in the realistic sense were absolutely devoid of subject, might be likened to graceful compositions in abstract music, in which pure beauty of tone and line are sought for, independent of any definite meaning. Some critics, American especially, held the exaggerated view that hence Mr. Moore was the greatest and most ideal English artist of the day; but inasmuch as painting is capable of expressing definite intellectual ideas and emotions, it must be held that a painter who expresses nothing beyond form and colour is restricted in his range. Even granting the completeness of abstract subjects such as those of Mr. Moore, he fell short in one most important element, intellectual and pathetic expression. His graceful women are dolls only, posed in charming attitudes, but totally destitute of character or individuality. We cannot admit that the greatest beauty of mere composition and colour can permanently atone for this intellectual deficiency. Nevertheless, Mr. Moore's pictures were charming creations of their kind, and they will long be missed.

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THE Belgian triennial *Salon*, which was opened at Brussels last week, is very disappointing in architectural work. There has been no dearth of good public or domestic work in the country during the last three years, but no trace of it is seen in the Architectural Room of the exhibition. M. Jean Baes is the only Belgian exhibitor of standing; he sends a number of neatly-drawn plans, some tinted sections and pen-and-ink elevations of his new Flemish play-house, together with some excellent photo-lithographs of the same building from a publication by M. Lyon-Claessen. The exterior of the theatre, which shows a free rendering of the Flemish style in the national sandstones of the country, is remarkable for the way in which a feature has been made of the numerous emergency balconies surrounding both auditorium and stage. The effect of the auditorium may be said to depend mainly on colour; the *foyer* contains some excellent wrought-iron work. Of the non-Belgians of standing exhibiting there is only M. Cuypers, of Amsterdam, who has contented himself with the contribution of some photographs of the new Central Station at Amsterdam. M. Cols is the only architect whose work calls for attention among the many academical exhibits shown, and this for the most part only on account of the neat draughtsmanship he has shown on the three huge sheets with which he illustrates a design for a "Palais de l'Industrie." M. Moerman shows some neat pen-and-ink sketches. Perhaps the most remarkable feature of the architectural exhibit is the entire absence of any perspective drawings. Not even a single student's attempt was shown in anything but plan, elevation, and section. Some readers may say, so much the better.

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THIS year's Art Exhibition at Munich has not received many contributions from architects, some dozen only having sent in drawings. Germany is but poorly represented, its only exhibitor of repute being Herr H. Seeling, of Berlin, whose work is, however, for the most part, shown in photographs. His cleverly-planned "New Theatre" at Berlin, and his lately completed theatre at Essen, to which we referred in a former number, are shown, together with his premiated design for the proposed Berlin Provincial Museum. Non-Germans are represented by Messrs. Honeyman & Keppie, of Glasgow, Herr Theyer, of Graz (Austria), and M. Baes, of Brussels. The Glasgow firm show their competition designs for the Glasgow Art Gallery and the Manchester Technical Schools competition, together with some interior decoration. Herr Theyer exhibits some façades of business premises, whilst M. Baes has contributed a collection of excellently-coloured sketches of a number of villas, boat-houses, &c., lately carried out under his superintendence, together with a large perspective showing the proposed development of the seaside resort Knocke, northwards of Ostend. Of the other exhibits we would only mention some drawings of the extension of the Munich Town Hall, by Herr Graessel, of that city. Herr Graessel showed great ability in this very difficult and responsible piece of work, and may be congratulated on the successful result obtained.

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THE competition between the capital towns of rival Swiss Cantons has always been most conspicuously shown in their public works. We have lately alluded to the unprecedented building activity of Zurich, and now we find that Bern is intent upon following its rival's example. Besides the restoration of the Cathedal by Professor Beyer, of Ulm, at a cost of over half-a-million francs, and the extensive restoration of the picturesque towers and fountains of the city under the superintendence of the energetic City Architect, the new museum is in course of erection, and according to the estimates of the architects (Messrs. Lambert and Von Rodt, of Stuttgart and Bern respectively), will cost the town at least 800,000 francs. Then Professor Auer's cleverly-planned design for a new Federal Council Hall has been practically passed by the Bern authorities, and will be carried out next year on a magnificent site between the old "Bundesrathaus" and the new Government Offices, which the same architect but lately completed at a cost of some two million francs. Among other Government buildings the newly-opened General Telegraph Office (planned by Messrs. Dorer & Fuchslin, of Baden) is to be soon followed by a University Building of some pretension, whilst church architecture is to be represented by a place of worship designed by Herr Moser, of Karlsruhe, and philanthropic work shown by further specimens of the successful blocks of artisans' dwellings lately built by the Municipality. The erection of a new Assembly Hall has to be decided on within a few months, and at the same time probably the question of having the proposed new theatre, in connexion with this block will be decided—it is to be hoped in the negative, considering how unsafe it is to place a theatre under the same roof with another building. The civil engineers of Bern are also to have plenty of work found for them. Amongst the most important works they will have charge of we must mention a proposed set of long bridges, of which one has just been completed, and a proposed city extension westward.

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THE Huyett & Smith Manufacturing Company, of Detroit, Michigan, U.S.A., have introduced into England the Smith's Hot Blast Apparatus, which is a well-designed, compactly-arranged combination of engine, fan, and steam-heating chamber for the supply of fresh warmed air to the main ducts of a ventilation scheme. The engine is of vertical type, made to run at high speed, without detriment from the dust and dirt frequently found where mechanical ventilation is needed. The fan is of the axial class, and appears from the illustrations to be of fairly high efficiency. The heater is a good example of steam apparatus, with horizontal tubes, and seems well adapted to adequately warm without over-heating the air passed through it. For cases where a central warming and propelling apparatus for large masses of air at low pressure and velocity is required, this system gives every promise of satisfactory results.

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AMONG the numerous new inventions in the way of bolts and latches which are brought before the public, the new one called the "lightning bolt," produced by a company who call themselves by the rather too ambitious title of "The Future Bolt Syndicate," is really ingenious and scientific, and worth special attention. It consists essentially of a long hasp fixed on the door-frame, on a swivel attachment which allows it to hang close to the frame or casing when the bolt is out of use. To bolt the door, the hasp is turned on the swivel and shut down on a swinging catch attached to the portion of the apparatus affixed to the door, when it fastens automatically; but by an additional turn given to the catch it acts also as a clip for tightening the door if at all loose in the frame. On the door being unbolted the catch automatically adjusts itself for fastening again when required. A couple of hasps fixed on the door portion of the bolting apparatus admit of it being padlocked for additional security. Furthermore, the hasp, by an ingenious and simple arrangement, can be made to perform the function of the ordinary door-chain for a partially opened door, but with the advantage that, unlike the chain, it not merely prevents the door being opened beyond a certain point, but holds it immovable at that point; it can be adjusted for two or three different degrees of opening, and can be padlocked open, so as to leave a room securely closed with the door sufficiently open for ventilation. The working is perfectly simple; the parts are all solid, and there are no springs, and nothing that can get out of order except by actual breakage. It is difficult to convey precisely the method of action by description, or even by an illustration; but every practical man who examines the make and working of this bolt will admit that it is a really ingenious thing, the outcome of a good deal of thought and contrivance.

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ADVERTING to our "Note" of the 16th instant, relative to the demolition of the chemist's shop in Southampton-street, Strand, a correspondent tells us that Messrs. J. Beedzler & Co., of "Ye Golden Keye," No. 20, Norton Folgate, carry on a druggist's business there which existed *circa* 1500. At the pulling down of their premises three years ago, they found some coins of *temp.* Henry VIII., an iron mortar bearing date "1520," and, in an old cabinet, a bound volume containing, with other works, a copy of Harvey's "Two Anatomical Exercitations concerning the Circulation of the Blood:" London, printed 1673.* Of Norton Folgate (Northern Foldgate, or Fallgate), the chroniclers vouchsafe barely more than a mere mention. It has been identified with the ten acres near Bishopsgate cited in the Domesday Survey, and, if this is correct, is one of the only two places in London named therein. An extra-parochial Liberty, belonging to the Dean and Chapter of St. Paul's, it stands without the City wall, and, as Mr. Riley suggests in his "Memorials," the gate there was probably only a drawbridge over one of the wide ditches of the marsh or fen. Rose-lane, with Flower, Primrose, Blossom, and Flower-and-Dean streets, perhaps indicate a later and more pleasing aspect of the ground; whilst Spital-square, formerly Spital-yard, Norton Folgate, took its name from the Priory and Hospital of St. Mary, founded, 1197, by Walter Brune, and Rohesia, his wife, for canons regular of St. Augustine, which at its surrender, being then valued as worth 478*l.* 6s. 8d. per annum, was, as Stow writes:

"A house of such relief to the needy that there was found standing at the surrender thereof nine score beds well furnished for receipt of poor people."

The square's site is that of the priory churchyard; Steward and Duke streets were built on the priory site: on that of the hospital was the house of Sir Horatio Parravicini, an Italian merchant and ambassador in Elizabeth's reign, in which *temp.*, James I., was lodged the ambassador of the Archduke of

* Addressed to John Riolanus the Younger, of Paris, in reply to his "Encheiridium Anatomicum," Leyden, 1648. A Latin copy in the King's Library, British Museum, is dated "Roterodami, 1649." Dr. Norman Moore, in the *National Dictionary of Biography*, says Harvey published in 1649, at Cambridge, at Roger Daniel's press, his "Exercitatio Anatomica de Circulatione Sanguinis, ad Joannem Riolanum filium Parisiensem;" and that the first edition of the "De Circulatione" in English was published at the White Lion in Duck-lane, London, in 1653, and a further edition in 1673, both by R. Lowndes.

Austria. The new girls' school, in Spital-square, representing the original ward school of Bishopsgate-without, was built in 1891 by Messrs. Woodward & Co., contractors, after the designs of Messrs. T. Chatfeild Clarke & Son; St. Mary's Church, originally a chapel built 1693, by Sir Geo. Wheler, Prebendary of Durham, in the square, stands close to the site of the cross where the Spital sermons were preached. Here, too, lived Bolingbroke, Pope's "St. John." As at St. Paul's, the cross had its Paternoster-row hard by.

THE old parish watch-house in Farringdon-road, Clerkenwell, has lately been pulled down. Built in 1794, it served as a watch-house for a period of twenty-nine years. When it was erected the thoroughfare was named Ray-street; in 1800 the authorities set up a pump here against the pump-house, No. 2, Ray-street (rebuilt as No. 16, Farringdon-road) with an inscription thereon saying that the pump stood four feet distant eastwards from the spring, or Clerks' Well. Twelve months ago the tenant of one of the two shops into which the house had been divided showed us the spot in the floor of his shop beneath which the water still ran, as it used to run down to the Fleet, which in its course here was once known as the River of Wells. The iron tablet and spout of the pump were fixed against the west wall of the tower of St. James's Church in 1878, close to where, as depicted in Agas's map, the spring poured forth into a stone cistern, which Stow mentions, against the outer wall of St. Mary's Convent.

WE regret much to find that Selby Abbey is again in want of repair, for which it seems very difficult to find funds. The vicar writes to the *Times* that the west front has shown signs of serious subsidence, and that it is estimated that 500*l.* will be required to carry out the necessary repairs. We hope those who have the means, and who take an interest in our great national buildings, will give some assistance in raising the sum required.

A FIRM carrying on business in Little Queen-street, Westminster, write to the papers in a very bitter spirit to complain of the inconvenience caused to them by the sudden announcement that the name of their street is to be changed, in consequence of the existence of another Little Queen-street (the one running into Holborn). Of course the inconvenience to individuals in these cases cannot be denied, but they must give way to the general good. The existence of duplicate names of streets is a constant source of trouble and misdirection of letters, and we quite approve of the action of the Council in endeavouring to reduce the number of doubles of this kind. "Atterbury-street," the proposed new name, is a very good historic Westminster name (a great improvement on the old one), and the inhabitants of the street had better make up their minds to the change.

DIOCESAN SURVEYORS.—At a meeting of the Archdeacons and Rural Deans, held at the Bishop's Palace at Wells last week, the following gentlemen were elected as Diocesan Surveyors under the Ecclesiastical Dilapidations Act of 1871, for the Diocese of Bath and Wells for a period of five years from September 15 inst., viz.:—Mr. Edwin Hippisley, of Wells; Mr. C. H. Samson, of Taunton; and Mr. C. R. Wainwright, of Shepton Mallett.

REGISTRATION OF PLUMBERS.—An unusually large number of candidates attended the examination for the National Registration of Plumbers at the Borough-road Polytechnic on Saturday last. There were, in addition to those from London, candidates from Yarmouth, Slough, Farnham, Guildford, King's Lynn, Tunbridge Wells, Northampton, Chesterfield, and numerous other places. The examiners were Messrs. Charles Hudson, J. Hume, G. Clegg, and Alderman Hind, of Stockton-on-Tees, master plumbers; and J. Howitt, C. Dean, and W. Curtis, operative plumbers. The result of the theoretical examination is deferred, but one-fifth of the candidates passed in practical plumbing.

## SCULPTURE AT THE CHICAGO EXHIBITION.

THE sculpture exhibited at Chicago may be divided into two parts, the first being that portion sent in as exhibits, and placed in the Art Building or scattered about the grounds, and having no relation to the architecture of the Fair, and the second part consisting of the sculpture employed on the buildings or designed in connexion with them, and which is naturally of more interest to architects. Of course, the display by foreign nations is entirely confined to the Art Building, and would be classified under the first heading.

Certainly never before has there been such a lavish display of sculpture in connexion with architecture.

Of course, it would be impossible in any permanent material to think of sculpture on such a scale as is here introduced, but it is a fine thing to see what can be done, especially when you have a material like "staff" which renders it possible, and the Americans are certainly to be congratulated on having carried out the scheme so thoroughly. We say Americans, but perhaps this should be largely qualified, for if we look at the names of the men who have executed the sculpture we find that, although they may be of American birth, their education, with a few noteworthy exceptions, is entirely French, and more than this, their studios are in Paris, and in many cases, as in the huge "Columbian fountain," the work has been executed there. It may be said that sculptors could not do better than study in Paris, but it does not alter the fact that an American school can hardly be said to exist, except in regard to one class of work to be mentioned just now.

Of all the American exhibits, whether in the Art Building or in the grounds, the most important is undoubtedly the Columbian fountain, by Mr. Fred MacMonnies, a young American sculptor, scarcely thirty years of age, who lives in Paris, and who engaged four ateliers for the execution of this great work. It consists of a female figure, representing Columbia enthroned on a triumphal barge, guided by a figure representing "Time" at the stern, with the rudder tied to his scythe, while in the prow is "Fame" blowing a trumpet; the barge is propelled by eight standing figures, representing on one side the Arts, and on the other Science, Agriculture, Industry, and Commerce. The barge is preceded by eight sea-horses, forming a circle directly in front, and mounted by eight young men as outriders. The design of the base is circular, and is 150 ft. in diameter, while it is flanked on each side by columns 50 ft. high, surmounted by eagles, the water to the basin being furnished by a half-circle of dolphins in the rear, and by a system of jets which entirely surround the barge and figures. As showing the scale, we may mention that the smallest figure is 12 ft. high and the largest 20 ft. The feeling of the whole conception is French, but it is we think very well handled. It is of course entirely a sculptor's work, in which allegory and imagination run riot, and are practically unrestrained by any architectural conditions. The figure of Columbia has been taken exception to, as not being sufficiently dignified, but even if this were so, it is treated with a freshness which in these days is very pleasing. It may be interesting to state that the fountain cost 10,000*l.* At the other end of the great basin is a colossal statue of the Republic, 65 ft. in height, and placed on a pedestal 35 ft. high. The sculptor is Mr. Daniel C. French, of New York. (See illustrations.) This figure is designed on a very different principle to the Columbian fountain; it is emphatically an architectural figure, treated in an almost archaic manner, in order to bring it into relation with the surrounding architecture, to which it is well proportioned. The statue is gilded. Though one can see a strong family likeness to the statue of Liberty at New York, we think it is treated in many respects in a very original manner.

Immediately behind, or to the east and over the triumphal arch at the centre of the colonnade or peristyle, is the Quadriga resting on the pedestal 40 ft. square. It is by Mr. D. C. French and Mr. E. C. Porter, and represents Columbus at the triumphal fête given in his honour on returning from his first voyage. The chariot is drawn by two pairs of horses, with a woman between each pair leading them; while an outrider is placed on either side of the group and somewhat apart, forming a somewhat novel treatment.

This group really comes under our second heading of sculpture in relation to architecture, but we have mentioned it here on account of its proximity.

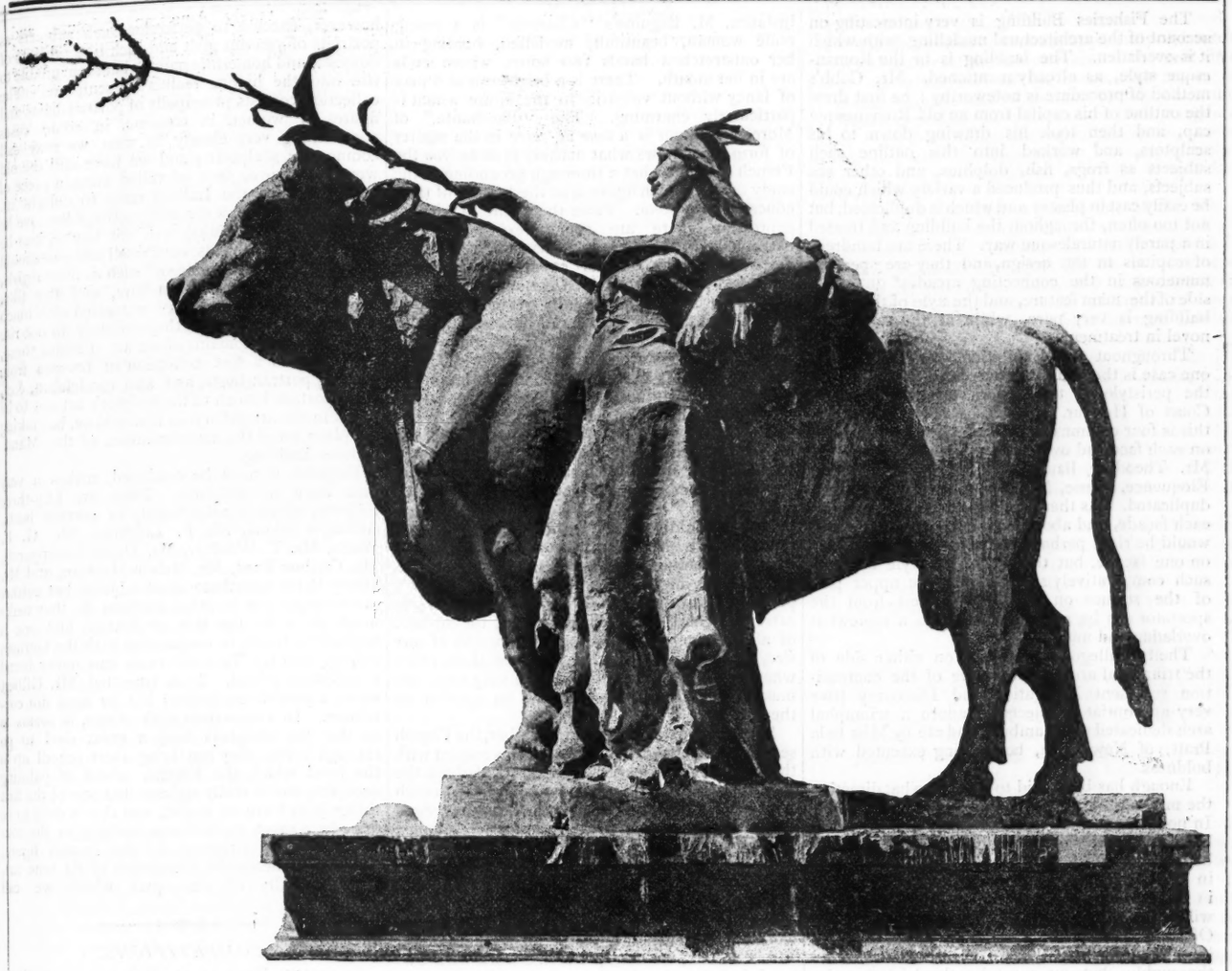
The most purely American sculpture, and therefore the most interesting in a national exhibition like this, is undoubtedly the series of native wild animals by Messrs. A. P. Proctor and Edward Kemeys; these are placed in various parts of the grounds, resting on pedestals at the ends of the bridges and elsewhere. The animals modelled are the puma, the buffalo, the polar and grizzly bear, the elk, and the moose, and one can tell at once that there is new and original treatment in these. We were, therefore, not surprised to learn that Mr. Proctor has had a training which is absolutely necessary in order to produce something purely national; in other words, he has been educated in the States and has studied from Nature herself. In short, Mr. Proctor began his art career as a cow-boy on his father's ranche in the Rocky Mountains, and it was from being an energetic and appreciative cow-boy that he became an appreciative artist, ready and capable of seizing the various idiosyncrasies of the animals amongst whom he passed his life. On the lonely prairie, undisturbed by the too often absurd theories of modern art education, from loving his animals he longed to portray them in the clay; thus we find that in two of his subjects he has produced works which are considered especially fine. These are placed, curiously enough, opposite the main entrance of the Transportation Building, also carried out in so novel a manner. One is an Indian, sitting barebacked on a horse, with his left hand to his eyes, and turned partially round gazing into the distance, while the horse, evidently frightened by subtle instinct of some danger which also troubles his master, holds his head in the air with an attitude of listening. The pose of the Indian and the conception of the whole thing are very fine. Will Mr. Proctor think it worth while to cast it in bronze say 18 in. high? The other subject is a cow-boy on a broncho, and in great contrast in that, while the Indian is at perfect rest, the cow-boy is in one whirl of action restraining his wild pony. If art is to represent the manners of a country, it seems a happy inspiration to place these two subjects in an American exhibition. The cow-boy is as much the part of American Western life as the quoit-player was of the Greek or the gladiator of Roman life; and if he had existed in these days he would assuredly have been depicted, but we doubt if with a purer artistic study than Mr. Proctor has bestowed on the subject. The various animals mentioned are treated with equally fresh feeling.

In the Fine Art Building, American sculptors, more or less under the influence of foreign schools, have made a good show; there, again, when treating of subjects of the Old World, they often fail, and not unnaturally. For example, the number of "Lady Godivas" scattered about the hall in every posture is considerable, and yet in not one of these is there the feeling or refinement we should like to see expressed; and it is to such groups as the "Buffalo Hunt," by Mr. Bush Brown, in which a semi-nude Indian on horseback is plunging an arrow into a buffalo, who is in the act of tossing his horse, that we see expressed something which is of necessity American—a phase in American Western life, treated with all the force and boldness of one who knows his subject. Of course, there are exceptions, as in Mr. Elwell's "Dickens and Little Nell," a very poetic conception, which we are sorry the London County Council could not see their way to accept for the adornment of London. Mr. W. O. Partridge's "Shakespeare" is also an exception, and is full of thought; but as the Americans study, and even revere, Shakespeare more than we do, this was in some measure natural.

Among some of the more notable exhibits are Mr. Dallin's "Signal of Peace," in which an Indian is sitting a horse barebacked, with his spear resting on his horse's back, carrying the flag of truce; in this, however, French influence is very apparent.

Mr. Tilden's life-size "Indian Bear Hunt" is a fine monumental group; so also is "The Closing Era," by Mr. Preston Powers, of Denver, and formerly of Florence, which represents an American-Indian gazing upon a dying bison, and apparently realising that his own race, like that of the bison, is rapidly passing away. The group, it is said, was named by the poet Whittier, and is very boldly executed; the life-size bison, with full shaggy mane, is stretched on the ground, while the Indian, with foot on back and bow in the right hand, gazes intently at the creature.

Mr. Gelert's "Struggle for Work," in which an old man and a boy are trying to snatch a work-



*Group from the Agricultural Building, Chicago Exhibition.—Mr. Philip Martiny, Sculptor.*

ticket from a man holding it aloft, is very expressive. Several full-size portrait statues and busts follow, and one especially to be noted is that of Abraham Lincoln in an easy attitude in an arm-chair, and full of thought.

Mr. D. C. French's "Angel of Death and the Sculptor," is a fine idealistic composition, and was executed in memory of a promising young sculptor lately deceased, and represents the Angel of Death taking him just at the completion of some great work which would render him famous.

The sculpture on the great buildings, which forms the second part of our subject, is, from an architectural point of view, of course, more interesting than these isolated pieces of the sculptor's art, and a few remarks about the more important groups will be advisable, and we have already slightly touched on some groups, and will therefore endeavour to confine our remarks to others. The Administration Building and the Agricultural Building are undoubtedly the most important on the ground, and are perfect architectural dreams, in so far as the connexion of the architecture and sculpture is concerned, the lavishness with which it has been carried out, and the impossibility of ever seeing a building executed in such a manner in a lasting material on account of the enormous expense. Mr. Karl Bitter, of New York, is the sculptor. The most important groups are those placed on either side of the four entrances, standing 34 ft. in height, and representing the four elements, Fire, Water, Air, and Earth, treated in their natural unsubdued condition on one side of the entrance, and on the other in the service of man, and controlled by him. Of course, these are all allegorically treated, and naturally proceed on French lines, probably being slightly rougher and bolder in general execution. A good deal of this vigour would naturally be lost if the work were executed in stone. We may, perhaps, shortly describe the allegory of one of these, and it will then be understood on what lines the rest proceed.

In representing "Fire," Mr. Bitter has shown the uncontrolled element by a female figure pushing forward, holding a snake in her outstretched right hand; she is resting on the form of a man, who, with full sensuous face, represents the storm, while beneath crouches the figure of a woman with a malicious expression secretly trying to set fire to a pile of wood. On the other side of the doorway is a figure of Genius lifting a torch as a symbol of light, the best gift rendered to us by fire, while a smith who has stricken a demon, with his hammer, to the feet of Genius, is intended to represent the usefulness of fire to man's daily usage.

The other great groups are treated similarly on the four wings containing the administration offices; and supporting the dome are twelve groups, three to each wing. These are on a much smaller scale and allegorise Strength, Patriotism, Charity, &c., while in the highest point at the sides of the four smaller domes are eight more groups allegorising the extreme culminating points of Human Culture, as Art, Science, Industry, and Commerce; War, Peace, Theology, and Justice.

In these groups, removed as they are from the eye, more consideration was naturally paid to decorative effect than accurate representation of any theme, and these groups, with outspread wings, form at this point, where it is needed, a sharp contrast with the severity of the architectural lines. The winged bas-reliefs in the interior have been already mentioned. The scheme of architectural sculpture on this building has been carefully considered by the architect and sculptor, and in consequence we have a result in which the one harmonises so well with the other.

The Agricultural Building approaches very closely the Administration Building in the profusion of its sculpture. Mr. Philip Martiny, of Philadelphia has contributed most of the sculpture work. In this building we jump at once from the allegory of the Administration Building to realism. A great deal of the decorative work finds its *motif*, as was natural, in subjects relating to agriculture, such as the maize, potato, and tobacco plant, while the great frieze contains the turkey, the representative wild bird of America. The building has apparently been designed for a rich display of sculpture, the massive piers which occur along the façades lend themselves naturally to the supporting of large groups.

Each of the four corner positions has its dome surmounted with statuary, consisting of a group of four female figures representing the four principal races of men (see illustrations) supporting a large globe, and grouping very pleasingly with the architecture, while groups of statuary, 20 ft. square, representing "Ceres" and the four seasons, occur over the piers already mentioned, and are succeedingly boldly treated with oxen, horses, and figures, and are well seen from the ground. On a smaller scale are Mr. Martiny's signs of the Zodiac and his figures of abundance. A draped woman holding sheaves of corn over the main entrance is the pediment by Mr. Larkin J. Mead, with Ceres as a central figure.

From the massing of these groups at well-defined points, perhaps this building appears even richer than the Administration Building, and is certainly an object-lesson in the value of contrast.

The Machinery Building is treated more sparingly of sculpture. Having passed Allegory and Realism in the two previous buildings, we here find Portraiture introduced. Mr. A. Waagen, the sculptor, has placed figures over the northern apsidal entrance bearing shields containing portraits of eminent inventors of machinery, while in the pediment to the Eastern entrance (see illustration), around the figure of Columbia are grouped inventors of machinery and the members of an examining jury, the two lower corners being filled by groups of lions representing brute force subdued by human genius, represented by two children. Other figure subjects occur on the roof, while the architectural sculpture proper, which is Spanish Renaissance in feeling, is very richly carried out.

The sculpture to the other buildings is not so elaborate, that to the Electricity Building consisting principally of a very fine statue of Benjamin Franklin, in which he is represented grasping with one hand his kite, which rests upon the ground, while the other holds aloft the key which was to act as conductor.

The Fisheries Building is very interesting on account of the architectural modelling with which it is overladen. The building is in the Romanesque style, as already mentioned. Mr. Cobb's method of procedure is noteworthy: he first drew the outline of his capital from an old Romanesque cap, and then took his drawing down to his sculptors, and worked into this outline such subjects as frogs, fish, dolphins, and other sea subjects, and thus produced a variety which could be easily cast in plaster and which is duplicated, but not too often, throughout the building and treated in a purely naturalesque way. There are hundreds of capitals in the design, and they are specially numerous in the connecting arcades* on either side of the main feature, and the style of the whole building is very pure, while at the same time novel in treatment.

Throughout the Exhibition, perhaps in only one case is the sculpture overdone, and that is in the peristyle at the eastern end of the great Court of Honour. It will be remembered that this is four columns deep, and on the balustrade on each face and over each column is a statue by Mr. Theodore Baur, 14 ft. high, representing Eloquence, Music, Navigation, &c., many times duplicated. As there are forty-eight columns on each façade, and above each is a figure, the effect would be right perhaps if they were placed only on one façade, but the whole peristyle being of such comparatively small depth, the upper part of the statues on the side farthest from the spectator can be seen, and produces a somewhat overladen and muddled effect.

The two allegorical subjects on either side of the triumphal arch in the centre of the composition represent Navigation and Discovery (two very appropriate subjects to adorn a triumphal arch dedicated to Columbus), and are by Miss Bela Pratt, of New York, both being executed with boldness.

Enough has been said to show in what direction the methods of sculpture have been carried out. In no previous Exhibition certainly has the work been done with such thoroughness and *bon accord* between architect and sculptor, and if it succeeds in bringing the two more thoroughly in touch in the future great buildings of America it will have done a great deal for architecture. Of course, as in the decorative art, if less had been done, it might have been executed more thoroughly, but we must be thankful that the Americans have not been frightened by the magnitude of the work; but that both architect and sculptor have combined to make their work that, which architecture without sculpture can never be, a work of art in the highest and noblest degree

The French have undoubtedly sent a very fine collection of sculpture. This was almost to be expected in an exhibition held in a country in which French art is so much studied and admired as in America, although in the painting section the French seem to have made no special effort.

The numbering of the objects is very badly managed; each bears two numbers, the official number and the number in the section of the country to which it belongs, which is confusing because not sufficient distinction is shown in the lettering, an arrangement far inferior to that which was adopted at Paris, besides which the sculpture of the different countries is intermixed to fit the spaces, and it is only by the colour of the pedestals that the country is ascertained. Taken generally there is considerably more refinement shown than in the American section, but we must say that it is often at the expense of the vigour and "go" which is visible in the latter section. There are 241 subjects to the 148 of the American section, but this number includes a large collection of historic sculpture sent by the Bureau des Monuments Historiques, by deducting which we find that the numbers are nearly equal. There are several large groups, amongst which may be mentioned:—"In Danger," by M. Houssin, a woman with two children in her arms, and gazing with troubled countenance into the distance. M. Gustave Michel's "Blind Man and the Paralytic," powerfully executed as to form and expression, in which the blind man gazes listlessly in front of him, and supports on his shoulders an older man, representing a paralytic. The whole composition is full of the softer and more refined traditions of the French school.

In the animal groups, as in M. Cain's "Rhinoceros attacked by Tigers," despite their ability, we do not see the same life as evinced by American sculptors. In some of the smaller works we see the particular direction in which the great skill of the French shows itself. For instance, M. Beguine's "Charmer" is a young nude woman, beautifully modelled, holding in her outstretched hands two horns, whose ends are in her mouth. There is a brightness and play of fancy without vulgarity in the figure which is particularly charming. The "Bacchante" of Moreau-Vauthier is a *tour de force* in the matter of form, and shows what masters in *technique* the French are, and what a thorough grounding in the study of the human figure is at the bottom of their educational system. From the point of view of expression there are some very noteworthy examples. M. Marioton's "Chactas," with blank despair depicted on his countenance, is well portrayed; while "The Conqueror," by M. Sanson, is finely and originally treated: it shows a nude man looking boldly in front of him, with proud mien, and holding in his right hand a short sword, which rests on his shoulder, while with the left he points disdainfully to his victim on the ground. It is in idealistic subjects such as these that the French are so successful.

The "Phryné" by M. Hannaux and the "Diana" by M. Lombard are finely-executed statues of the nude, in which the delicacy of form and limb are as carefully handled as in any Greek work.

M. Bartholdi (of Statue of Liberty fame) is represented by his "Washington and Lafayette," a colossal statue of the meeting of these two generals; it might look well on the top of a lofty pedestal, but as seen on a level with the eye is extremely coarse. This is, of course, the mistake of all sculpture shows in regard to works of any size, that one is unable to judge of their effect when placed *in situ*, which is the very view one must obtain before one can pass an opinion on them.

Portrait busts are very few in number, the French section offering a great contrast in this respect with the English and American sections. Perhaps the most noteworthy is that of M. Patenotre, the French Ambassador to the United States. Other small figure-subjects are sent in some numbers. Amongst the most pleasing are some by M. Hector Lemaire, and one in particular is his treatment of the "Eclipse of the Moon," in which a woman is treated, in an idealistic manner, with all the life, character, and piquancy of the best French work; it is sufficiently small for a mantelpiece, and is, in fact, an example of the work we are so much in want of in England, and which, brought within reasonable bounds in regard to expense, would compete with what we may call the commercial figure-subjects with which we are deluged, and would do much to raise the level of taste of the great middle classes of England.

Besides the modern work is the fine collection sent by the "Bureau des Monuments Historiques," which will belong to Chicago at the close of the Exhibition. The collection consists of large replicas in plaster, from historic French buildings, from the eleventh to the fifteenth centuries.

There are over 150 of these, and some are of immense size, standing in the middle of the Court. Amongst others is a portion of the west façade of Amiens Cathedral, a doorway from Notre Dame, Paris, and like portions from Rheims, Rouen, Sens, Chartres, Gaillen, and Limoges, besides reproductions from the work of Jean Goujon, Lehongre, Masson, Michel Colombe, and others, forming altogether a collection of which France may well be proud, and which, sown on soil apparently so susceptible as that of America, should show good results.

The Germans are not so strong in sculpture as in the painting section, and one is at once struck with their inferiority of perception as to the true artistic value of sculpture, and also in technique, as compared with the French. There are no very large groups, and the subjects consist mainly of tamely-handled figures, representing such subjects as Sleep, &c. Of course, there are exceptions, to which these remarks do not apply, but we are now speaking in a general way, and of the general effect produced on us. A great many of what we may call the "patriotic" statues, are lent by the National Gallery at Berlin, and show us the three latest Emperors in various attitudes, and of which one is apt to tire, especially as they are executed with no more than ordinary ability.

In coming to Italy, we notice at once a considerable difference in treatment and execution. The size of the subjects is generally smaller, and the absence of the nude is at once apparent. There is a considerable display, two large rooms being filled. In the circular dome-covered hall are four statues, 5 ft. high, allegorical of Europe, Asia, Africa and America, treated in a very feeble manner, and with the other attempts in this gallery, tend to show that the Italian School is unable to idealise any subject. The Italians, however, execute to perfection such subjects as portraits of peasant girls and such-like subjects of domestic and home-like nature, but seem unable to rise into the higher realms of sculpture. The collection consists principally of portrait-busts and figures of women in costume, in some cases approaching very closely to what we may call commercial sculpture; and we have still the old worn-out *tour de force* of veiled faces, a piece of trickery which the Italians seem to delight in. The Italian eschews the nude, perhaps because he finds the Italian nation will not buy it, but he revels in such subjects on a small scale as should please the "British matron," such as flower-girls, fruit-sellers, gipsies, fisher-boys, and the like, many of which we must say are treated with much skill, although, perhaps, they certainly do not rise into the higher domains of the art. Besides these, there is also a fine collection of bronzes from ancient portrait-busts, and also candelabra, &c., an important branch of the sculptor's art not to be found in the art gallery, as it should be, but taking its place amid the commercialism of the Manufactures Building.

England, it must be confessed, makes a very poor show in sculpture. There are fifty-three subjects, which consist largely of portrait busts. Amongst others, Sir F. Leighton, Mr. G. F. Watts, Mr. T. Woolner, Mr. Hamo Thornycroft, Mr. Onslow Ford, Mr. Nelson Maclean, and Mr. Harry Bates contribute small subjects, but neither in technique nor in other respects do they make much show by the side of France, and one is inclined to think, in conjunction with the German exhibit, that the Teutonic races can never found a sculpture school. It is true that Mr. Gilbert seems a notable exception; but he does not contribute. In comparison with others, it seems to us that the sculptors have a great deal to go through before they can bring their school up to the level which the English school of painting occupies, and it really appears that one of the first things is to learn to model, and this is only to be done by a much more severe training in the construction and setting-up of the human figure, which is certainly the foundation of all true art, and especially of that part which we call sculpture.

* See *Builder* August 19, p. 133.

## *COMPETITIONS.*

PROPOSED TECHNICAL BUILDINGS AT REIGATE.—Meetings of the Technieal Education Committee for the Borough of Reigate and District were held at the Market Hall, Redhill, last week, to receive and consider the Building Committee's report upon the five sets of designs for the proposed Technical Buildings sent in by local architects in pursuance of the invitation of the Committee. After considerable discussion the plan marked "Quantum," by Messrs. Baker & Penfold, was selected as the best, and the Building Committee had no hesitation in recommending that plan as the one for their adoption. A formal letter from Messrs. Baker & Penfold giving their opinion that the design could be carried out within the limit of cost laid down (3,500*l.*) was read.

## *ARCHÆOLOGICAL SOCIETIES.*

DURHAM ARCHÆOLOGICAL SOCIETY.—From the *Newcastle Leader* we learn that the fifth meeting in 1893 of the Archæological and Architectural Society of Durham and Northumberland was held on the 22nd, the members driving from Durham to Sacriston Heugh, Chester-le-Street, and Lumley Castle. At Sacriston the party visited the old Grange of the Sacristy of the monastery of Durham, of which considerable and interesting remains exist. On reaching Chester-le-Street, the site of the bishopric previous to the foundation of Durham, the party proceeded to the church, where Canon Greenwell gave an address on the history of the building, which, he said, was placed within a Roman camp of very considerable size, about the same size as the camp of Lanchester. He thought there were no remains of the ditch or walls of the camp left, but excavations had traced it out sufficiently to show that the camp occupied about six acres, a much larger camp than most of the similar camps in the North of England. It was upon one of the great Roman roads, off the line of Watling-street, which ran by Binchester, Lanchester, and Elchester to Corbridge. Chester-le-Street Camp was on another line of road, running to the mouth of the Tyne, towards South Shields. The name Chester was from the camp. The first thing they knew about Chester-le-Street was that the congregation of St. Cuthbert settled there in 882, when fleeing from Lindisfarne Island because of

the Danish incursion. The reason they settled at Chester was that it was quite likely, almost certain, that the great remains of the old Roman station were still left; probably the surrounding walls would be in more or less good condition, possibly very little injured at all. The remains of buildings of very considerable size would be left upon the site, and would form a very convenient place for the congregation to occupy in room of Lindisfarne. The first church put up at Chester-le-Street was a wooden one, and it remained till the time of Bishop Egelric, who made the stone church at Chester-le-Street, and spent a good deal of money in doing good works in other places. Of the old wooden church replaced by the stone one there was not the least trace. Mr. Hodges, explaining the architecture of the church, said that the wooden church was supplanted by a stone church. That was all the history they had. In almost all the old churches some fragments of the original Saxon structure still existed. An examination of the ground-plan of Chester-le-Street church showed at a glance it was impossible that the church could have been all laid down at one time. It had grown up bit by bit. It consisted of a long nave and long chancel. It had no transepts. It had a western tower, entirely within the church. All that was the typical or normal plan of the church. There were two or three additions. This somewhat complicated plan could not have been laid down all at once. A remarkable feature in the church was the extraordinary nature of the column at the end of the third bay in the nave. If the church had been put down all at one time and the architecture all of one date from end to end that column could not have been put in for any reason whatever. The explanation was that the two western bays of the nave were the lengthening of the church westward to what it was originally. He carefully examined it a year or two ago, and it was then he really understood, as he had not understood before, the plan of the church. The three eastern bays of the nave, as far as the double column, represented the nave of Egelric's church, and the chancel of the present church represented the chancel of Egelric's church. A certain portion of that church was still standing above ground in the south wall of the chancel. That explained the whole ground-plan of the church, and all the peculiarities and difficulties of plan died away as soon as they accepted that theory.

# Illustrations.

## AN ANCIENT HARBOUR.

AT the present time there does not exist, as far as I am aware, any Mediæval harbour which retains all its ancient characteristics. It is true that at Lubeck, La Rochelle, St. Malo, &c., portions, or indications of the ancient arrangement may be traced; but, owing to the greatly increased size and importance of vessels of every description, the necessities of modern commerce have swept away most of the erections which rendered the Mediæval ports so highly picturesque.

From ancient drawings and pictures, however, those in the *Nuremberg Chronicle*, for instance, Aitzinger's "De Leone Belgico," Somern and Ravestein's "Brabantia," we are enabled to restore on paper some of the picturesque arrangements of an ancient harbour.

One of the most striking features must have been the single or double archway upon which the ramparts of the town were carried across the mouth of the harbour. As a rule there would appear to have been two arches with a projecting turret between them; its outer face and that of the ramparts themselves were defended by battlements and loopholes, but the inner face presented the appearance of an open gallery of timber, covered with a slate or tile roof. The object of this treatment is obvious. If by any chance this important defensive work fell into the hands of the enemy, it was impossible for him to use it against citzens or the harbour itself.

In close proximity to this fortified entrance, and generally within it, were the water-gate and the great lifting-crane. Good examples of the former structure exist in some of our English towns, notably Norwich and Sandwich, and at Andernach on the Rhine is a fine example of a Mediæval crane mounted upon its round tower. A very striking and picturesque one was destroyed a few years ago at Bamberg, which was of post-and-pan work.

The great warehouses and bonding warehouses which surrounded the harbour were themselves fortified, loop-holed, and machicolated. The great tower of the principal church generally overlooked the harbour, and was, as a rule, so solidly constructed, that it was capable of serving as a kind of castle, or a place that could be defended as a last resource. Probably also these great lofty church towers, such as we see in Holland and Belgium and round the English coast, were used for purposes of signalling. The people in the Middle Ages were eminently practical in their ideas, and knew well how to make their buildings serve two, and sometimes three, different purposes; the covered galleries which form such interesting features attached to the ramparts of old German towns are, where they still exist, now used as rope-walks, and I should think it is extremely probable that this was frequently their ancient use in times of peace. I should mention, in conclusion, that the drawing which accompanies this article does not represent any particular place, but is purely a composition.

H. W. B.

## VISITORS' STAIRCASE, AVERY HILL.

THE "Visitors' Staircase" at Avery Hill is constructed in English oak, as also the panelling of the corridor leading to it. The spandrels to the arches on ground and first floors are richly carved; the wall above the dado is lined with Tynecastle tapestry, decorated in gold.

The ceiling was modelled from special designs by the architect, and executed in plaster.

The work was executed by the building contractor, Mr. J. T. Chappell, the panelling to the corridor by Messrs. Smee & Cobay.

The drawing was exhibited at the last Royal Academy Exhibition.

## STABLES, KING'S WALDEN, HERTS.

THESE stables have been erected for Mr. T. F. Harrison, in place of those recently pulled down, and are situated within the park.

They consist of a stable of eight stalls and two loose boxes, a visitors' stable of four stalls, and a third stable of five hunting-boxes, a large and small carriage-house, horse-washing, harness-cleaning, and saddle-room, and sick-horse box, etc., etc. On the west side of the archway leading into the courtyard, there is a cottage for the head coachman; also a messroom and bedrooms for the grooms, with ample loft space for hay and straw.

The buildings are faced with red bricks supplied by the Rowlands Castle Brick Company, near Portsmouth, the stone dressings being from Messrs. Trask & Son's Doulting Quarries. The roofs are covered with green slates, with red ridging tiles, and the whole of the stable fittings and paving has been executed by the St. Pancras Ironwork Company.

Mr. W. J. Adcock, of Dover, is the contractor, and the architects are Messrs. Beeston & Burmester, of London.

The drawings were exhibited in the Royal Academy Exhibition.

## SCULPTURE AT THE CHICAGO EXHIBITION.

THESE are a few examples, reproduced from photographs, of the sculpture which has been so profusely used in the decoration of the Exhibition buildings at Chicago. They are referred to and commented on in the article on the subject on another page.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.—The annual meeting of this Association was held in the Town Hall on the 20th inst. The officers for the ensuing session were elected as follows:—President, Mr. H. H. Higginson, M. S. A.; vice-presidents, Mr. C. Lonsdale and Mr. P. F. Ruthven; committee, Messrs. R. Calderwood (past president), C. W. Hill, A. W. Johnson, and F. J. Nickols; hon. treasurer, Mr. E. B. Newton; hon. secretary, Mr. J. Rush Dixon, City Surveyor's office.

ORDNANCE SURVEY OF DUMFRIESSHIRE AND KIRKCUDBRIGHTSHIRE.—The results of the new Ordnance Survey of the burgh of Dumfries will shortly be published. The town has been surveyed on a large scale, an inch to about 46 ft., and, including Maxwelltown, the charts will occupy twenty sheets. The survey of the counties of Dumfries and Kirkcudbright has also been practically completed. The country districts are surveyed on a scale of 25 in. to the mile, and each sheet will deal with an area of 960 acres. Numerous additions have been made to the moats formerly indicated, these discoveries being chiefly due to Mr. O'Brien, an officer of the Survey.

## ANCIENT CROSSES IN THE ISLE OF MAN.

THESE ancient crosses are apparently the work of one maker, of the name of Gaut. His name, that of his father and of his home, the names of contemporaries and of patrons, remain authentic from a period of the history of the little Kingdom of Man, from which few other authentic names survive, and the crosses that he made are also among the few substantial survivals of that far-away time.

The name of Gaut occurs on two of the Manx crosses. The inscription on a cross at Kirk Michael is, that "Bridson, the smith, the son of Athacan, raised this cross for his own soul and of his faithful friend, Gaut, who made it, and all in Man." On another cross at Kirk Andreas it is stated that "Gaut, the son of Biarn of Cooiley, made it."

Of the locality of Cooiley little can be determined. "Cooiley," which is Manx, is in English the place of a dwelling that is "hidden" from the wayfarer among hollows in the land. There are many Cooileys in the island. The relation of Gaut and Bridson which the cross of Bridson indicates suggests that the home of Gant may be found in the district where Bridson's Cross now stands.

On a terrace in the hills above Kirk Michael is the little farm of Balla Cooiley. The dwelling-house is unchanged from the style of house which prevailed in the island three centuries ago. A roof of thatch covers its low solid walls. One wall contains the doorway, the opposite wall the small openings which light its small interior. The house is not without dignity, and it is almost grim in its great simplicity of art. From this place the whole north of the island may be seen stretching out level and blue into the blue sea and sky. Within the palpitating blue of this plain are the abiding settlements of the people, and among them are to be found the crosses which are to be considered the work of Gaut. Higher in the blue are the clear forms of the countries of Scotland and Ireland. Twenty miles away, the southern part of the island is in most outward things similar to the north, but the work of Gaut does not extend there.

Over the hills, about three hours' walk, on the eastern coast, is a small district where are crosses which differ largely from those in the north. Sentiment would indicate them to be of earlier and of independent origin. There the crosses are in pairs, in the north this would seem to be not so. The stones have the form of a circular head on a narrower shaft. In the north they are rectangular and oblong. They are carved on one face only, and on the other are rough as when broken from the quarry; in the north they are carved on both faces and polished. The pattern where it occurs is of no motive but lineal. In the north the pattern has almost always evidence of and reference to motives and inspiration from things real or imagined outside its own limits.

There is common to the crosses of both east and north the conception and treatment as of a painter's. There is common also in all the ornamentation, taking the design on each cross as a whole, evidence of a feeling for rightness of structure which seems personal in its origin. The arrangements at the feet of the Onchan cross and of Olaf's cross at Kirk Michael, and the position of the smaller cross on the slab of Olaf's cross at Kirk Ballaugh, are examples of conscious perception and deliberate aim with regard to the mass of the design.

Nowhere in the island is there a cross which is conceived independently as a cross. Seen from a little distance they are long, narrow slabs of blue stones. Always, with the exception of Thorlaf Neaci's Cross at Kirk Braddan, the cross, in relief about half an inch, extends over the surface of the slab and terminates usually at the foot in no definite design, but passes into the ground. The crossing is usually surrounded by a nimbus. The great length of shaft on the northern crosses does not occur in the east. In the east, where the Greek form of cross is used, it is with a feeling for its deficiency in this respect, so that the cross is supplemented underneath by an otherwise independent extension of pattern down the shaft of the slab. In all cases the patterns are carved on the cross itself, and on the spaces between the cross and the edges of the slab, and sometimes on the sides of the slab. In the spandrels and on the sides of the slabs are cut the inscriptions, where they occur, and the figures and animals sometimes added for the enrichment of the slab. The patterns, almost always extending continuously over these parts, are cut with a sharp chisel, whose marks remain fresh and distinct. The

*Fig.* 1.

*Fig.* 2.

*Fig.* 3.

*Fig.* 4.

*Fig.* 5.

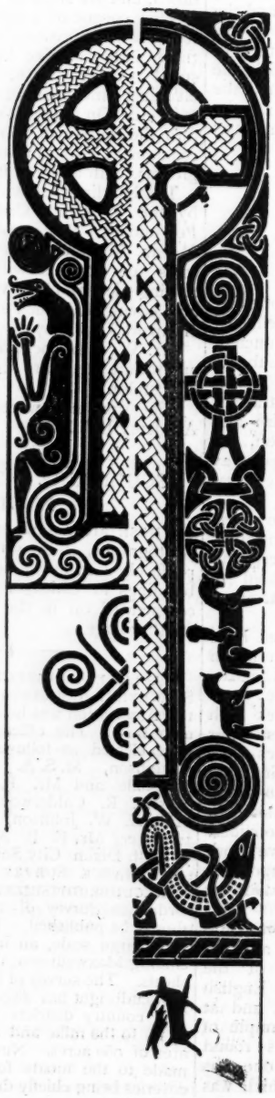



*Fig.* 6.

*Fig.* 7.

*Ancient Crosses in the Isle of Man.—Drawn by Mr. Archibald Knox.*

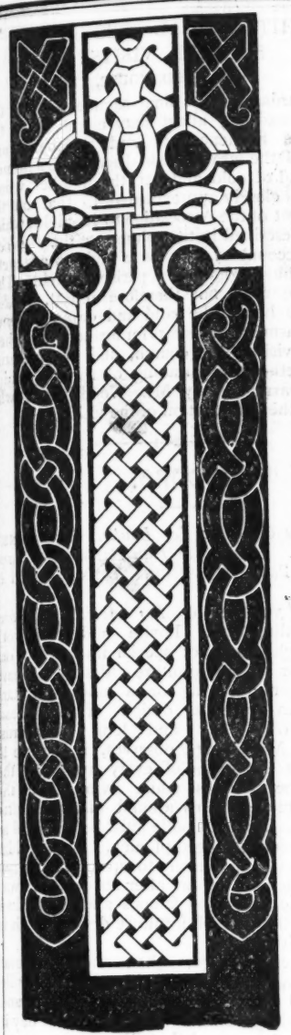


*Fig.* 8.

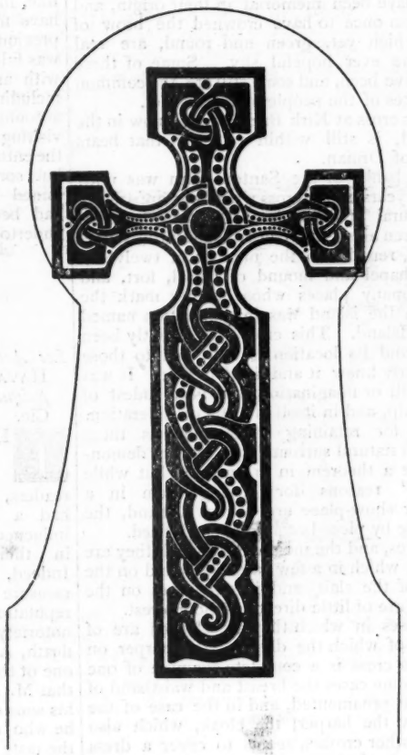


*Fig.* 9.

*Fig.* 10.

*Fig.* 11.

*Fig.* 12.

*Fig.* 13.

*Fig.* 14.

*Fig.* 15.

*Ancient Crosses in the Isle of Man.—Drawn by Mr. Archibald Knox.*

REFERENCES.

| FIG. | | | ft. | in. |
|---|---|---|---|---|
| 1. | Thorlaf Neaci's Cross, Kirk Braddan | Width | 1 | 0 |
| 2. | The Lonan Cross, Kirk Lonan | ,, | 3 | 0 |
| 3. | The Braddan Cross, Kirk Braddan | ,, | 1 | 8 |
| 4. | The Glen Roi Cross, Lonan | ,, | 2 | 6 |
| 5. | St. Katherine's Cross, Onchan | ,, | 2 | 6 |
| 6A. | The Onchan Cross, Kirk Onchan | ,, | 1 | 6 |
| 6B. | Olaf's Cross, Kirk Michael | Width | 1 | 8 |
| 7. | Olaf's Cross, Kirk Michael | ,, | 1 | 6 |
| 8. | "The Cross of Bridson the Smith, which Gaut made," Kirk Michael | ,, | 1 | 4 |
| 9. | Olaf's Cross, Kirk Ballaugh | ,, | 1 | 4 |
| 10. | A Pattern on Thorlaf Neaci's Cross | Width at base | 0 | 4 |
| 11. | Malumkun's Cross, Kirk Michael | Width | 1 | 4 |
| 12. | A Cross at Kirk Maughold | ,, | 1 | 8 |
| 13. | A Cross at Kirk Maughold | ,, | 1 | 2 |
| 14. | St. Peter's Cross, Kirk Onchan | ,, | 2 | 0 |
| 15. | St. Peter's Cross, Kirk Onchan | ,, | 2 | 0 |
| 16. | St. Michael's Cross, Kirk Michael | ,, | 1 | 10 |

treatment is always charming, and never spoiled by notions of symmetry, always direct, and the pattern has practically no other relief than that given by the cut which delineates it.

Thorlaf Neaci's Cross at Kirk Braddan is in its contours and proportions distinct from all the other crosses in Man, and its mass suggests a conception different from and better than what its decoration indicates. Bridson's Cross is the grand type of practically all the crosses. In structure, Thorlaf Neaci's Cross has the incomplete conception characteristic of the eastern crosses. The pattern on it is identical with that on Bridson's Cross.

This pattern is the only one Gaut uses, and it occurs in its simplest form on Bridson's Cross. It consists of two waved lines crossing and recrossing, locked at each crossing by a ring, which, independently, or in some not readily distinguishable motive, grows out of one wave and in a symmetrical arrangement encircles the crossing and attaches itself to the other.

It expresses the very elementary sentiment of stability out of which the art of the builder grows.

The cross and its encircling nimbus, which is the subject of his art and the symbol of his salvation, he adopts as a form which he makes to constantly recur in one guise or another. This is the essential principle of his art.

There are some half-dozen variations of this arrangement of Gaut's pattern. Of these, the one on Thorlaf Neaci's Cross of the adder winding through curling grass is the most important among them. The accident of style, which limits expression, does not control fancy nor prevent sympathy for spectacles such as this indicates.

In a recent summer among the mountains that lie between Kirks Braddan and Michael, I saw the same pattern which Gaut uses on Bridson's Cross used by a young girl for the decoration made with whitening stone on the threshold stone of her house.

The accommodation of pattern to the shape of the arms of the cross, as in the cross of Bridson, is good; but on all the crosses where pattern occurs the device used does not vary from this, nor do the patterns on the shafts often have any organic relation to the arrangement in the head of the cross. Of further value in determining the sense in which Gaut's declaration that he made all the crosses in Man is to be understood, is the use of the spirals, as on Olaf's Cross at Kirk Michael, and on the Onchan Cross, and, of equal importance with their use, the blank space on the shaft of Malumkun's Cross at Kirk Michael.

*Fig.* 16.

On all the crosses, howsoever they seem locally to differ from the remainder, are to be found many similarities of pattern and fancy, which lead the mind only to the conclusion of the common and personal origin of them all.

The past history of the crosses is hardly known. Some now serve a common purpose—for the market and the wayside; most are gathered into the churchyards of the parishes; and it cannot be said of any stone that it stood here or there. All may have been memorial in their origin, and would seem once to have crowned the brow of tumuli, which yet, green and round, are real against the ever hopeful sky. Some of these mounds have been, and some still are, the common burial-places of the people of the district.

Druian's cross at Kirk Bride, though now in the churchyard, is still within a district that bears the name of Druian.

On the banks of the Santon Burn was until about two years ago, a cross which was apparently in its natural environment. From its station could be seen along the river banks from its source to the sea, remains to the number of twelve or more of chapel and mound of burial, fort, and mill, and many places whose names mark the time when the island was in admiration named the Holy Island. This cross has recently been removed, and its location is unknown to those who formerly knew it and lived near it. It was without skill or imagination, the very rudest of workmanship, and in itself of little consideration.

Reasons for retaining relics such as these amidst their natural surroundings, are not demonstrable like a theorem in arithmetic, but while "practical" reasons for storing them in a museum or show-place are always at hand, the land is piece by piece becoming poor indeed.

The figures, and the incidents of which they are the subject, which in a few cases are found on the spandrels of the slab, and in two cases on the cross itself, are of little direct artistic interest.

The dresses in which they are clothed are of two kinds, of which the dress of the harper on Malumkun's cross is a complete example of one kind. In some cases the breast and waistband of this suit are ornamented, and in the case of the figure below the harper, the cloak, which also occurs on other crosses, seems to cover a dress similar to that of the harper. Of the other kind is the kilt, which in the case of Gunnar seems to hang from the shoulders, and in other figures is also confined at the waist by a band.

Beyond this broad delineation, nothing can be seen of the aspect of men. The treatment of the figures is only as a silhouette. Occasionally a head-cover, a basket, or a sword is to be seen, but that is all.

Of what they are the subject is not easily to be discovered. Popular knowledge connects them with Norse work, and it is probably among such work that a solution of some of the subjects on the crosses will be found. There is a common subject on all the crosses, that of the hunt of the deer by dogs and a rider on horseback or by men on foot. This is accompanied by various incidents apparently incongruous, and it is impossible to separate the elements of the episodes. There are the subjects, several times repeated, of a man stabbing a serpent with a sword, a man with a bird on his shoulder, a group of men beneath the feet of an animal, but what they refer to has disappeared from popular tradition.

But what is absent from the crosses is as much a matter for wonderment as what is on them. More still a matter for wonder is the fact of the existence of the crosses. The exuberance and humour of them, as much in the fancy of the persons for whom they were made as of their maker, are, amidst the simpleness and austerity which have always distinguished the life of the island people, like a cloud which for a short time appears in the blue depths of the sky.

Such is the work of Gaut, the son of Biarn, of Cooiley, and the faithful friend of Bridson the smith.

ARCHIBALD KNOX.

*Douglas, Isle of Man.*

CLASSES FOR BUILDING TRADES.—For several years the Carpenters' Company, in conjunction with the Institute of British Wood Carvers, have carried on classes for wood-carving in Chapel-street, Bedford-row. Having outgrown the accommodation there, they are now inaugurating a much larger scheme. The premises known as the West London School of Art, at 155A, Great Titchfield-street, have been taken, and it is intended to have classes there, with competent teachers, for all the trades connected with building. Already the Tylers' and Bricklayers' Company have joined, and besides the wood-carving classes, which are in full operation, classes for carpentry, joinery, and bricklaying will be commenced on October 2.

## ARCHITECTURAL ASSOCIATION SUMMER VISITS:

### HATFIELD HOUSE.

ON Saturday last the final summer visit of the year was made by about sixty members to the well-known residence of Lord Salisbury, and doubtless if the weather had been more summer-like, instead of cold and wet, the number would have more closely approximated to that on the previous visit of the Association to Hatfield, which was fully described in the columns of the *Builder*, with an account of the house and its adjuncts, including the neighbouring parish church. This account we need not therefore repeat. After visiting the house, the cold and damp lessened the enthusiasm of the visitors for further researches, but some visited the church, and the majority joined together in partaking of the tea which had been arranged by Mr. Woodthorpe, who undertook the organisation of the visit.

## Books.

*Les Artistes Célèbres: Les Boulle.* Par HENRY HAVARD. *Philippe et Jean-Baptiste de Champaigne.* Par A. GAZIER. Paris: Allison et Cie.

THE volume of *Les Artistes Célèbres* dealing with Boulle and his work ought to be of special interest to our readers, for few furniture designers have had a larger following or a more important influence on taste in design of this class, in their own day and long afterwards. Indeed, as M. Havard observes, if we are to measure the happiness of every artist by the reputation he acquires while living, and the notoriety which remains around his name after death, André-Charles Boulle must be regarded as one of the most privileged of men. It is of him that M. Havard has chiefly to speak, for though his sons carried on his art after his death, it was he who made the name famous and established the taste for the style of furniture design which is connected with it.

Half-a-century ago, when the Mediæval movement was commencing, the work of Boulle was regarded with horror, as vulgar, showy, and destitute of all pure taste. In the present day it is likely to be regarded with much greater respect, and perhaps with more admiration or indulgence than it can rightly claim. There is no doubt an element of vulgarity, in the artistic sense, about Boulle's work. There is a total absence of reserve or restraint about it; it is the kind of furniture which is expressed by the word "handsome"; it seems always to aim at making as much show as possible, and details, figures especially (or rather parts of figures), are lumped on to it without regard to their relation to the lines of the whole, just to give an effect of richness. Some of Boulle's defects, however, are those of the prevalent style of his day—a day of showy and tawdry ornamental detail. On the other hand he often employed this type of detail better than his contemporaries; there is a unity of conception about his furniture pieces; and while they always make a false note in what may be called a domestic interior, there is a kind of pompous character about them, without littleness, which renders them exceedingly suitable for the furniture of palatial rooms, where there is plenty of space for their large curves and swellings to be in no one's way, and where everything else is sumptuous and in keeping with their style. There is never any repose in a Boulle design; but the generation and the class for which Boulle worked did not want repose. One of the worst points about his furniture is the frequently very bad design of the legs or feet, which seldom seem designed for the purpose of support. But Boulle filled a large part in the art work of his day, and merited a special record. The present one is largely illustrated with engravings of his designs, and is altogether an interesting addition to a library of artistic biography.

We cannot feel the same interest in the biographical sketch of the two Champaignes, portrait painters (mainly) who have not much repute beyond France. The "Vanitas," by Philippe, a study of a skull, a richly ornamented watch, and a glass vase of flowers, shows that he could on occasion do something effective and suggestive in still-life painting. The numerous engravings from the portraits made by these artists, many of which are of well-known and famous men of the time of Louis XV. and XVI., give an interest to the volume.

*Bibliothèque d'Éducation Artistique. Motifs Décoratifs.* Par JULES HABERT-DYS, AUGUSTIN DE SAINT-AUBYN, et JEAN J. FRANÇOIS LE BARBIER. *Alphabets.* Par JULES HABERT-DYS, G. MARIA MITELLI, JEAN DANIEL PREISLER, THÉODORE DE BRY, et FRANÇOIS E. EHRMANN. Paris: G. Pierson et Cie.

THESE are small pamphlet publications containing sets of designs, by the various artists named, for ornamental alphabets and "Motifs Décoratifs." The latter mean, of course, the kind of small decorative designs which are used as headings of chapters, &c. The French have a great love for these decorative adjuncts, and show much variety and spirit in their design, but in the majority of cases with a great want of real feeling for decorative style and treatment. Generally speaking, the style of treatment is too naturalistic, when objects from nature are used, and the design too ragged in line; in fact, this latter seems to be an object with the French designers; the idea of restricting the design within formal lines harmonising with the lines of the page and the type never seems to occur to them; to be free and spotty is the object. M. Habert-Dys, the only modern artist of the set, draws largely on animals, birds, and flowers for his "motifs"; they are all well drawn and carefully studied and grouped, but there are few that an English artist would care to make use of for the purpose for which they are intended. They go too far towards being pictorial for use as head and tail pieces, and for the most part they are deficient in point or meaning. Now a head or tail piece of this kind should have a meaning, to give it real interest; should suggest some little fancy or allegory. This additional interest is quite wanting in most of M. Habert-Dys's cleverly-drawn sketches. Saint-Aubin's (1736-1807) represent the old French taste for collections of medals, masks, and other articles grouped together; a taste still in force with some old-fashioned French periodicals. We should be very sorry to make use of them. Le Barbier's designs (1738-1826) are many of them superior in grace and in thoughtfulness to either of the above mentioned sets; some of them are very suggestive, and he introduced the figure well. Among the sets of alphabets named, three are old, and four (three by Habert-Dys and one by Ehrmann), modern or comparatively so. Of the old ones, those of Preisler (Nuremberg, 1660-1737) are the best; they are purely decorative in the old German style of elaborate intertwining, and are in good taste; their defect being a want of clearness of definition of the letter. Those of Mitelli (Bologna, 1634-1718), consisting of figures of men twisted or posed into the shape of letters, are detestable; and those of De Bry (Liège, 1528-1598) are only historically interesting; they represent the exuberant fancy of the Renaissance not in its best form; large letters, with nude figures seated on or climbing about them, and hung with all kinds of unmeaning accessories. Of the modern sets, those of M. Habert-Dys show great variety and cleverness, and are treated in a much more conventional and decorative manner than his "Motifs"; but there is a kind of showy cleverness of line about them, looking like the decorative efforts of a clever writing-master, which is vulgar in spite of its cleverness. The letter S which we give from one of them will show what we mean, and we think most of our readers will agree in our estimate of this kind of work. We should add that in the more elaborate set in which birds and animals are freely introduced as adjuncts to the letters they are very cleverly drawn and treated—but there is always this rather *clinquant* style about the designs. The alphabet by M. Ehrmann is much the best of the whole. He makes the human figure his principal object, and draws and designs it really well and with true feeling for decorative effect. We give the S from his alphabet, as an example of his method. If we mistake not, he has long furnished the initial letters for *L'Art*.

*Initial letter by M. Habert-Dys.*

*Initial letter: by M. Ehrmann.*

An examination of the whole set of these collections serves to show that we have nothing to learn from the French in this kind of design, more especially in the class of "Motifs." In sculpture and in some branches of painting the French are our masters; but in this kind of decorative design there are head pieces appearing in some of our illustrated magazines every month which in decorative effect, in refinement of taste, and in poetic suggestiveness, are far beyond anything the French designers can show us, if these books are at all fair specimens of their work.

## Correspondence.

*To the Editor of* THE BUILDER.

### PORTLAND ROACH STONE.

SIR,—I was much gratified on reading (under the heading of "Notes" on page 203 of the issue of your valuable Journal of 16th inst.), the article respecting Portland Roach stone, because I have, for a considerable time, been doing my utmost to again bring this stone to the front. It has fallen into disuse, I believe, simply in consequence of another generation of architects having the construction of present-day buildings in hand, and who, like the Egyptian king who "knew not Joseph," are strangers to this important, *cheap*, and uniquely weathering product of the Island of Portland.

I am glad, however, to say my efforts appear to be meeting with a certain amount of success, and for some considerable time now I have had orders for this stone upon my books, a further augmentation of which I have received this morning. It was formerly sent from the island in very large quantities annually, and reference to the works in which it was used, and likewise to the many and very extensive Government works (fortifications, breakwater, &c.) here—not forgetting the parish church, to which reference was made in your issue referred to—will prove how splendidly this stone is able to resist every kind of atmospheric influence, and from a series of tests made here some years ago by the late Sir John Coode, C.E. (copy of which I have), it was proved to be, to all intents and purposes, fully equal to granite for all ordinary engineering purposes.

When passing Messrs. H. Castle & Sons' timber-yard, Millbank end of Vauxhall Bridge, recently, I noticed their entrance-gate piers were made out of Portland roach stone, and I think your readers will early next year be able to see a very fine example used in a large public building which will then be in course of construction in London.

There is also, in the island, another bed of stone which is used locally for building purposes, and particularly when immediately adjoining or near a fire, which I think only requires to be brought to the notice of architects, who would find it to be admirably adapted for a variety of building purposes, especially for cores for making cement cornices, &c.

Any information which your readers might wish to have it would afford me the greatest pleasure in furnishing them, especially as I have so long endeavoured to re-introduce this stone into the market as formerly. F. J. BARNES.

## The Student's Column.

### GEOLOGY.—XIV.

#### STRUCTURAL DEFINITIONS.

HAVING defined the origin, structure, and composition of the various classes of minerals and rocks useful to the architect and builder, we are now in a position to describe certain physical and structural terms affecting the mode of occurrence of all, or nearly all, rocks; after which, the divers causes which have brought about the present configuration of the surface of the country, and the influence of geology on scenery, will be alluded to in much detail.

*Bedded Strata.*—Stratified rocks of little thickness frequently present much variation in lithological character; sand alternates with clay, or both may be parted by thin layers of limestone. Each of these different kinds of rock is called a bed by the geologist (not by the quarryman, who adopts another meaning for the term), or a stratum. In each bed a number of lines, marked by being of slightly different tint, or otherwise, may often be observed; these are termed "lines of stratification." When these lines or layers are parallel to one another the rock is said to be "bedded," and when they are very close together it would be called "laminated." The term "bedding" is sometimes applied to tolerably thick strata presenting no distinct lines of stratification beyond those which define it lithologically from the bed below and above.

*False Bedding.*—Where the lines or planes of stratification are not parallel, but cut each other in series in divers directions. Such a structure is frequently found in sands and sandstones, and denotes that they have been laid down in shallow water, where the currents have continually shifted about the material.

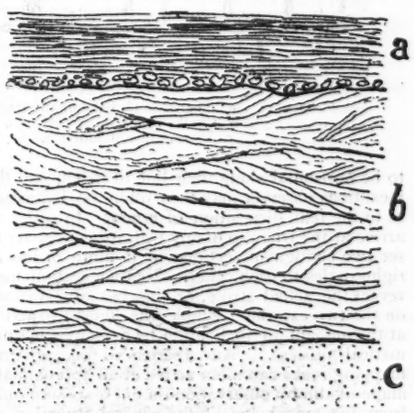



*Fig* 1.—*False Bedding, Oldhaven Sands, Herne Bay.*

*a.* London clay, with pebbles at base. *b.* Oldhaven sands, false bedded. *c.* Thanet sands.

*Ripple Marks.*—These are observed on the surface of many thin-bedded sandstones, used for paving purposes. They are irregular ridges, half an inch or so in height, and a few inches apart from each other, which have formed in very shallow water. Gentle breezes causing little ripples on the surface of the water have produced the phenomenon.

*Rain Spots.*—Pittings on the surface of soft shore deposits, which have subsequently become covered up and preserved by sediment gently laid down on the return of the tide. Many passing showers in Palæozoic times have thus left their mark behind, and show us, with other things, that certain atmospheric phenomena in those remote periods must have been very similar to what obtains at the present day.

*Sun Cracks.*—The heat of the sun in drying the surfaces of clays and muds between tide-marks causes cracks to form in the material, and these also have their counterpart in almost the most ancient rocks. The tracks or trails of crawling organisms, together with the footprints of various extinct animals which wandered along the shore, have likewise been carefully preserved to us.

*Dip.*—The inclination of strata to the horizon resulted from the sediment not having been originally laid down horizontally, or (more frequently) from having become tilted at an angle by the action of subsequent earth movements. *a* in fig. 2 represents the dip of strata. The amount

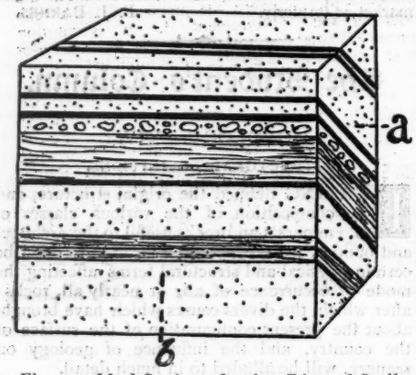



*Fig. 2.—Ideal Sections showing Dip and Strike of Strata.*

*a.* Dip face; *b.* strike face.

of dip, or angle of inclination, is determined by a simple instrument called a clinometer.

*Strike.*—A direction at right-angles to dip, illustrated by *b* in Fig. 2. Strata always appear to be horizontal along their line of strike, and the incautious observer may thus often be led astray as to the real disposition of strata. In order to arrive at the true dip of any bed, it is necessary to see two contiguous sections of it more or less at right-angles to each other. Neither section may reveal the actual strike, or dip, but observations on the two exposures enables the student to arrive at the amount of inclination by a simple mathematical process. An experienced geologist in mapping rocks can often arrive at an approximate angle of dip by observation on one exposure only from his knowledge of the general direction of strike of the rocks of the district.

*Outcrop.*—Where strata become exposed at the surface of the ground; if, for instance, the existence of a bed were known only from well borings and mining operations, and does not come to the surface, it would be said to have no outcrop. When beds are horizontal, the direction and area of outcrop are dependent on inequalities of the surface of the ground, by the removal of superficial deposits, or from analogous causes.

*Unconformity* in strata is a common phenomenon, requiring more explanation than we have space to devote to it. There are several kinds of unconformities. Fig. 3 represents one where a

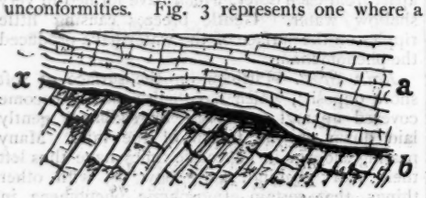



*Fig. 3.—Unconformity, near Clifton, Bristol, between Beds inclined at different Angles to each other.*

*a.* Trias. *b.* Devonian. *x.* Unconformity.

lower bed, *b*, dipping at a high angle, has been extensively denuded prior to the deposition of bed *a*. The two formations concerned would be said to be unconformable to each other; and in this case indicates an enormous lapse of time between their respective epochs of deposition, for the Devonian was laid down in water, then raised into dry land, denuded, and submerged again before the Trias was deposited on its tilted edges. In the interval, the whole of the Carboniferous and Permian were in process of construction, and the fauna and flora of the whole earth underwent a complete change. Much more striking examples of the meaning of unconformity could be adduced. Thus, deposits at present forming off parts of the Welsh coast are being laid down on Archæan rocks; the unconformity in that case representing the lapse of practically the whole of geological time since the appearance on earth of the first organisms of which we have any certain knowledge, to the present epoch. On the other hand, instances could be quoted from Norfolk and Suffolk where an unconformity exists between the Pliocene (a very recent deposit) and the formations now in progress off the adjacent coast.

Another kind of unconformity is where the rocks are not inclined at different angles to each other, but the upper bed rests on the denuded or uneven surface of the lower. In fig. 4, where, the planes of stratification of both formations concerned are practically parallel to each other, the bed. *a* rests unevenly on *b*. It may be well to remark in reference to this particular illustration that the unevenness of the surface of the chalk is not the *direct* result of denudation prior to the deposition of the Thanet sand. The irregular line of junction as now seen, is due to the agency of percolating water which has dissolved the upper surface of the chalk (it was no doubt uneven), leaving behind an insoluble residue, in the shape of a bed of rough flints. Nevertheless, if not actually indicated stratigraphically an unconformity between the beds alluded to must be inferred on palæontological grounds, the fossils in the upper formation being so different to those found in the lower that geologists have caused even so great a line of demarcation as separates the Secondary from the Tertiary to be drawn along that horizon. The change in the fauna indicates an enormous lapse of time.

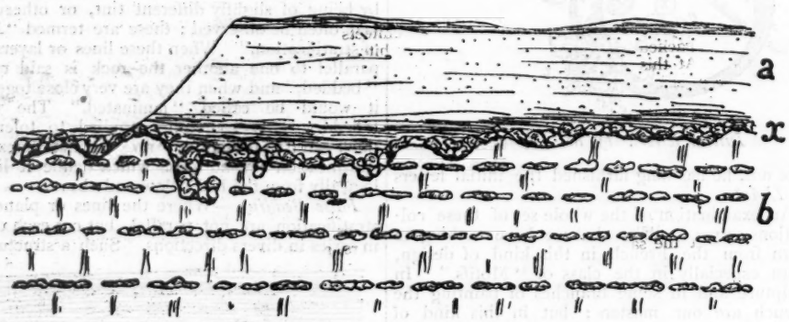



*Fig. 4.—Section at Orpington, Kent.*

*a.* Thanet sand, horizontally stratified, capped by mould; flints at base.
*b.* Chalk, with lines of flint, also indicating horizontal bedding.
*x.* Uneven line of junction.

We must here caution the student that mere irregularity along the points of junction of strata with each other as seen in sections is not an infallible proof of unconformity. Such an appearance may have been produced by the action of contemporaneous submarine erosion in the formation, or deepening of a channel by the velocity of a newly-formed or sporadic current. We have a good example of this off the Norfolk coast at Yarmouth. The irregularity should normally be accompanied by a corresponding change in fauna as indicated by the fossils in the respective beds. In some cases a considerable difference in fauna is observable in beds apparently conformable to each other, but when traced over a wide area their true relations are frequently revealed.

## *GENERAL BUILDING NEWS.*

STAFFORD ODDFELLOWS AND FRIENDLY SOCIETIES' HALL.—The new building which has been erected in the main street of Stafford to meet the growing requirements of the friendly societies of the town was opened on Monday. In the first instance, a premium was offered for the best design for the hall, and was won by a London firm of architects. Subsequently these plans were found not to meet requirements, and the Building Committee instructed Mr. George Wormal, architect and surveyor, Stafford, to prepare entirely new designs. Difficulties, however, arose with regard to ancient lights, which rendered necessary new plans, and the design as now carried out was the outcome. Tenders were obtained, with the result that Mr. W. T. Woollams's estimate was accepted at 2,400*l*. The hall is built of red pressed Ruabon bricks and Bath stone dressings. The ground story to Greengate-street is occupied by two bold elliptical arches and piers. Over these a large oriel window, having stone mullions, cornices, parapet, and corbel springing from between the arches in a carved boss, forms the principal feature of the front. It is flanked on either side by a narrow one-light window, with stone dressings. The elevation terminates in a gable with five-light window, surmounted by moulded copings and scrolls, and finial terminations. The roof is covered with tiles of a dark strawberry colour, and has an ornamental turret springing from the ridge, eight-sided, and ornamented by scroll-kneelers and turned finials. On the ground floor, and facing Greengate-street, are provided a lock-up shop, 21 ft. by 14 ft., and public entrance, vestibule, and lobby. The rest of this floor is occupied with club accommodation. The whole of the next floor is occupied by a public hall, in connexion with which are cloak-rooms and dressing-rooms, communicating by private passage with the stage. The hall measures 53 ft. by 27 ft., the height to ceiling being 23 ft. The stage is 17 ft. in depth, and the proscenium opening 16 ft. wide. Over the cloak-rooms a gallery is formed capable of accommodating 100 persons in rising tiers, and there are in all seats for about 500 persons.

NEW POST-OFFICE AT GLOUCESTER.—The new Post-Office was opened on Monday. The front portion of the Corn Exchange, formerly occupied by the Corporation, has been transformed, and will be used as the Post-Office. The Tolsey had been for a great many years the home of the postal officials, but the old building had become quite inadequate for exigencies of the present circumstances. After some negotiations the postal authorities secured a portion of the Corn Exchange as being the most convenient site for their offices. The façade of the Exchange has been slightly altered, while the entrance to the large hall has not been curtailed, nor has the hall itself been interfered with. The ground floor is set apart for the general office, being 48 ft. long and 20 ft. wide, with a long counter on the right-hand side. The end of the counter near the entrance will be used for the issuing of money orders and the Post-Office Savings Bank, while the central portion of the counter will be devoted to the sale of stamps, &c., immediately behind which are the old private boxes from the Tolsey office. The top end of the room has been set apart for telegraphing and parcels post. Every convenience has been made for the adequate despatch of business in this department. On the first floor are the postmaster's private room and the chief clerk's and public enquiry office. On the same floor is the clerk's retiring room, and well-arranged lavatories are also on this floor, as well as on the ground floor. There is also a store-room adjoining. On the top floor is a store-room in connexion with the Savings Bank, Parcels Express Delivery, and Parcels Post, on the same landing of which has been preserved the strong room, formerly used by the Corporation. Mr. William Jones, builder, has carried out the structural alterations, and Messrs. Bissell, of Bristol, were entrusted with the internal fittings.

A BUILDING MANIA.—A writer in the *Bath Chronicle* says:—"At Gay's Hill, Bath, houses are run up so close to the back of others as effectually to screen off both air, light, and view, not to speak of other nuisances created by such close proximity, and in addition to the evils described, the tenants have been deprived of their allotments, which gave the men healthful employment in their leisure hours. In close proximity to these new houses will be the concluding series of a long row called Belgrave-crescent, now approaching completion, built just in front of the second row of houses in Camden-road—thereby depriving its inhabitants of the fresh air, splendid view and privacy which they so much prize, and of course greatly deteriorating the value of the property. Below these two long rows a third has been built, and now the new houses behind Gay's-hill will form the fourth, all on the slope of the hill, and choking up what might well be called "the lungs of Bath."

RESTORATION OF IRTHLINGBOROUGH TOWER.—The re-dedication by the Bishop of the diocese of the Irthlingborough church tower and bells, after restoration, took place on the 20th inst. The old tower (a well-known and picturesque structure) was taken down on account of its dangerous condition. The new tower is on the old site, and identical in shape and build to the old one. It has been erected by Messrs. Brown & Sons, Wellingborough, from the plans of Messrs. Talbot, Brown, & Fisher, architects, also of Wellingborough. Most of the old structure was of Barnack stone. The new one is of Barnack stone, Weldon stone, and ironstone. The cost has been about 2,800*l*.

ENLARGEMENT OF ST. MICHAEL'S CHURCH, BISHOPSTON.—The laying of the foundation-stone of the north aisle, transept, and vestries of St. Michael and All Angels', Bishopston, was performed by Lady Lucy Hicks-Beach on the 21st inst. in the presence of a large assemblage of spectators. The continual increase of the population of this suburb of Bristol and the crowded state of the church have made it necessary to increase the church accommodation. The church has been already enlarged three times since it was built in 1858; but it still seats only 520. The proposed present addition is that of a north aisle, transept, vestries, and organ-

chamber, which will add about 250 seats, and, together with a suitable system of warming and ventilating the church, will, it is anticipated, cost upwards of 2,000*l*.

NEW ROOF TO ST. MICHAEL'S CHURCH, LYNDHURST.—The new roof to the church of St. Michael and All Angels, Lyndhurst, has now been completed, at a cost of over 1,000*l*., Mr. White, F.S.A., of London, being the architect.

NEW EPISCOPAL CHURCH AT ABERFOYLE.—The memorial stone of the new Episcopal Church of St. Mary, which is now being erected at Aberfoyle, was laid last week in presence of a large gathering of people. The site on which the church is being built is situated at the eastern extremity of the village. The church consists of a nave and chancel, with south transept, and the roof is an open timber one. Externally the lower part of the wall are built of native blue rubble, the upper part being rough cast and coloured white. The roof is covered with dark-blue slates from Aberfoyle quarries. Rising from the roof is a stone belfry, which marks (externally) the division of nave and chancel. The church accommodates 200 persons, exclusive of choir seats in chancel, and will be seated with chairs throughout. The architect is Mr. James Miller, Glasgow.

NEW CHURCH AT NORTHAMPTON.—The Bishop of Peterborough consecrated a new church, dedicated to St. Matthew, on the 21st inst. The church has been built by Mr. Pickering Phipps, as a memorial to his late father, who was for many years member for the borough. The building is in Early Decorated style of architecture, the chancel being vaulted and the nave spanned by stone strainer arches, above which expands a fine open roof. The baptistry at the west end is also vaulted, and provision is made between the choir and the north chapel for a minstrels' gallery. The whole of the church is lighted by electricity, which also is used to work the organ. The total cost will be about 20,000*l*. The architect is Mr. M. H. Holding, and the builder Mr. Henry Martin.

ROTHERHAM.—On the 21st inst. the ceremony of laying the foundation-stone in connexion with a Sunday school which is in course of erection by the Primitive Methodists of Masborough, took place in the presence of a large assembly. The site is on "the old College estate," College-road, Masborough, and it is intended to build a chapel to seat upwards of 700 worshippers, and a Sunday-school to accommodate 600 scholars. Contracts have been let amounting to about 3,500*l*. The new building is to be of the Renaissance style of architecture. Mr. Howdill, of Leeds, is the architect.

## *SANITARY AND ENGINEERING NEWS.*

POLLUTION OF WATER AT SALFORD.—The York people have been by no means alone in having reason to complain of the state of the local rivers. There have been loud complaints from several other localities with regard to noxious effluvia arising from local streams, canals, &c. Especially noteworthy is the complaint from Salford that the Manchester Ship Canal has become dangerous to the health of the inhabitants of the county borough, and the neighbourhood. The President of the Local Government Board admitted recently in Parliament, that it was a very difficult and perplexing matter of undoubted seriousness. The Canal Company has impounded 114 acres of water in the borough of Salford, and that area contains the sewage of an immense mass of population on the banks of the Irwell. That it is injurious to health is not denied. It has been suggested that, by way of elucidating the difficulty as to responsibility, &c., proceedings at law be taken against the Canal Company, and that application be also made to Parliament for further powers. But while in Salford there seems to be no doubt as to the sewage or where it comes from, here in York it would seem as if certain people cannot be got to realise and admit what is really the condition of the water of the Foss.

NEW SEWAGE WORKS AT OLDHAM.—The Mayor of Oldham (Mr. Alderman Noton) cut the first sod last week of the new sewage works for the borough. The works are in the Slacks Valley at Chadderton, and the cost of the scheme will probably not fall far short of 200,000*l*. Mr. Law, engineer of the works, describing the sewerage scheme, said the governing principle upon which it was designed was to admit into the intercepting sewers the dry weather flow of sewage, and only such an amount of rainwater as it was intended to convey to the outfall works. The total length of the sewers was about 10½ miles. An area of about 100 acres at the southern extremity of the borough was at too low a level to drain into the intercepting sewer by gravity. It was intended to lift the sewage from this area to the intercepting sewer by means of Shone's ejectors placed in a chamber beneath the roadway. These ejectors worked by the agency of compressed air, and by a very simple arrangement the sewage from the Manchester Road sewer would be made to compress the air for working the ejectors, thus obtaining the requisite power without any expense. The total estimated cost of the undertaking, including the purchase of the land and engineering and other expenses, was 200,000*l*. Of this sum the engineer's estimate for the works was 130,000*l*. The Corporation recently advertised for tenders, with the result that they obtained offers from responsible contractors which showed a saving on the engineer's estimate of upwards of 7,000*l*.

SEWAGE SCHEME AND ELECTRIC LIGHTING, MONMOUTH.—At a special meeting of the Monmouth Town Council, held on Friday morning, the Mayor presiding, a complete system of drainage, combined with the introduction of electric light for public and private purposes, was unanimously adopted by the Council. The sewage scheme accepted is by Mr. Nicholson Lailey, of Westminster, S.W., and the electricians are the Brush Electrical Engineering Company, London, both of whom furnished exhaustive reports, and the gross expenses of the complete scheme are set down at 15,095*l*., which will be borrowed and repaid by thirty equal instalments. As the profit from the electric light will be considerable, it is estimated that a 5d. rate will be sufficient. The sewage would be delivered into a reservoir through an outfall sewer, with a gradient of 1 in 350 or about. On arrival at the precipitation tanks all coarse particles would be removed and the sewage mixed with ferrozone, afterwards passing through a channel to the tanks, which, when filled, would be shut to allow two hours' precipitation. The water would then be removed, passed on to filter-beds, irrigated over the land, and finally into the river purified. The sludge, then going by gravitation into sludge bays or lagoons, would be air-dried, or, if required, pressed into cakes of manure. The machinery would be worked by hydraulic pressure—the sewage pump by day and the dynamo by night.

THE WATER SUPPLY OF LEEDS.—The prolonged drought is keenly felt by the public and the authorities. The former are accustoming themselves to the order that the water supply shall cease at seven o'clock at night; and the authorities view with anxiety the fact that the water in the reservoirs is only 21½ days' supply. This is the lowest figure that has ever been reached since the present system was inaugurated. At this time last year the supply was 103 days. In the Fewston reservoir there are 86 million gals., compared with 764 million gals. at the corresponding date last year. Swinsty now contains 331 million gals. of water, whereas last year the quantity was 904 million gals. At Lindley Wood there are 82 million gals., and last year there were 616 million gals. The total available quantity is 500 million gals., as against 2,283 million gals. last year. The present daily requirement is 3·16 million gals., and at the same time last year it was 2·16 million gals.

## *STAINED GLASS AND DECORATION.*

LANDPORT.—The chancel of All Saints', Landport, Hants, which was one of the last works of the late Sir Gilbert Scott, has lately received an east window, representing the "Ascension," from the studios of Messrs. Mayer & Co., of Munich and London.

A NEW STAINED GLASS WINDOW, BYFIELD.—The west window in the tower of Byfield Church, which has just been filled with stained glass, was unveiled on Sunday last. It is a two-light window, and is a memorial to the late Mr. John Bromley, for many years churchwarden of the parish, and Sarah, his wife. The subject is a representation of the Apostles SS. Peter and Paul, with their usual symbolic emblems. The colours are subdued, but this was purposely so arranged to prevent the darkening of the nave of the church. The window was designed and executed by Mr. Kemp.

## *FOREIGN AND COLONIAL.*

FRANCE.—There is to be raised at Peronne (Somme), on the esplanade of the château, a monumental statue in bronze to Marie Fourré, a celebrated heroine who in 1593 saved the town from invasion.——The town of Clichy is building a large municipal abattoir, intended to replace the various existing smaller ones which serve the west part of the suburban zone of Paris.——The Société des Amis des Arts of Nantes is to open an art exhibition in February next, to remain open during the month. ——M. Blavet (architect) has just finished, in collaboration with M. Dolivet (sculptor), the design for a "monument à la gloire de Germain Pilon," which is to be erected at Mans, the native place of the celebrated sculptor. The monument will be composed of a triangular pedestal, somewhat resembling that of the "Trois Graces" in the Louvre. At the angles of the pedestal will be three caryatides, and on each of the faces small figures in bronze representing Sculpture, Painting, and Architecture. Above the pedestal will be a marble column crowned with a Renaissance capital surrounded by a bronze bust of Germain Pilon.——As has already been mentioned in our columns, the "Palais du Capitole" of Toulouse is the object of some very important decorative work, which has been entrusted to eminent painters and sculptors, all natives of that town. MM. Falguière and Mercié have accordingly been commissioned to decorate the intercolumnar spaces in the Salle des Illustres; and the same two sculptors will also complete the Gallerie des Archives. Some large compositions are to be executed by M. J. Paul Laurens. Three ceilings will be entrusted to MM. Benjamin-Constant, Rixens, and Debat-Ponsan, and six panels of *genre* scenes are to be painted by MM. Henri Martin, Destrem, Gervais, and Rachon.——The town of Djelfa (Algeria) has opened an architectural competition for the building of a monumental mairie.——The death is announced of M. Dauterville, architect to the City of Rheims, and officially attached to the Mairie.——M. Falguière has just completed a fresh model of the "Monument de la Revolution Française," intended for the Panthéon. This new model will shortly be erected in its intended position of the work, in order that the Fine Arts Committee may judge if the work is sufficiently in harmony with the general decoration of the building.——M. Roger Ballu, "Commissaire-Général des Expositions," has just presided at the opening of the Tourcoing Exhibition.——The observatory at Mont Blanc, situated at 4,812 mètres above sea level, has just been completed.——The *Journel Officiel* has just published the list of the General Committee for the Paris Exhibition of 1900. We observe with great surprise that the list, which numbers about one hundred names, includes no architects, and even the "Directeur des Bâtiments Civils," the chief of the most important official service of architecture in France, is not a member.——An International and Colonial Exhibition at Lyons is to be opened in the April of next year, to close in the following November.——The restoration of the church of Saint Pierre at Chaillot is just being completed. M. Flandrin, son of the celebrated painter, Hippolyte Flandrin, has been commissioned to execute the decoration of the vault of the choir in this building.

NORWAY.—The municipality of Christiania has invited designs in a public competition for drinking fountains and seats for the parks and squares in the city, premiums being offered of 50, 100, and 150 kr. The jury consists of three eminent architects chosen by the Norwegian Engineer and Architect Association, at the request of the authorities.——A huge block of buildings, chiefly artisans' dwellings, and embracing a whole quarter, has just been completed in Christiania. They are four stories high.——Some very pretty telephone kiosks are now being erected by a company in various parts of Christiania from designs by Herr Dahl, architect. The kiosks are octagonal in shape and five mètres in height. Outside they will be covered with advertisement glasses, whilst inside, in addition to telephones, there will be available barometers, thermometers, guides, &c. On the top will be a clock with four dials, lighted by electricity. The interior will also be thus lighted at night.——The great machinery buildings of the Christiania Electric Tramway Company are now nearly completed, and the making of the machines has been commenced. ——The municipal authorities of Bergen have granted a sum of 60,000 kr. towards the building of a permanent exhibition house of industries and arts in that city. As the additional funds required have also been subscribed, the building will be commenced at once.——A new church has been opened in Asak, designed by Herr Suhrke, architect. It is a structure of red bricks and granite, capable of holding about a thousand persons.——An interesting ruin is now being excavated in Norway, viz., the old fortress and palace of Stenviksholm, situated on an island in the Throndhjem's fjord, and built by Archbishop Eystein in the fifteenth century, but subsequently destroyed by fire. The ruins are said to be well worth a visit. The palace must have been one of the finest in Norway of that day, and the fortress a very strong one. The principal hall, the "Bishop's Sal," is 80 ft. in length and another 60 ft. The towers and walls are very massive. What is of particular interest to architects and archæologists is that the stones are of the same kind, and bear the same marks of the stonemasons as those of the Throndhjem Cathedral, from the then ruins of which they have no doubt been taken by that worthy ecclesiastic for his residence. Naturally a large number of antiquities, arms, &c., have come to light, the most interesting being perhaps majolica, tiles, and remnants of stained glass windows. The excavations are being carried out under a State grant.

## *MISCELLANEOUS.*

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—On Friday, September 22, this Society visited the new improvement works of the London and India Docks Joint Committee at Blackwall, now in course of construction from the designs of Mr. H. F. Donaldson, M.Inst.C.E. These works are of considerable importance, as on their completion vessels drawing 29 ft. will be able to enter the docks. The works consist of enlargements of the old lock entrance from the Thames, and of the two cuts that give communication between the Blackwall Basin and the Import and Export Docks. These cuts will be increased in width from 45 ft. to 60 ft., and increased in depth from 25 ft. to 30 ft. A new engine and pumping station will be built, the docks deepened, and a new swing bridge constructed. The party were shown over the works by the contractors' agent, Mr. A. Beale, the contractors being Messrs. Lucas & Aird. Among those present were the President of the Society, Mr. R. Bolton, the Hon. Sec., Mr. E. H. G. Brewster, Mr. A. Woalheim, Mr. Millington, Mr. Spark, and Mr. Adams.

# COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENT.

## COMPETITIONS.

| Nature of Work. | By whom Advertised. | Premiums. | Designs to be delivered. |
|---|---|---|---|
| *Police Offices and Cells | Colchester Corp. | ..... | Oct. 31 |
| *Moveable Road Bridge over River | Flintshire C.C. | 100*l.* | Dec. 1 |

## CONTRACTS.

| Nature of Work or Materials. | By whom Required. | Architect, Surveyor, or Engineer. | Tenders to be delivered. |
|---|---|---|---|
| Additions, &c. to Workhouse | Leicester Guardians | A. H. Hind | Oct. 3 |
| Additions, &c. to Workhouse | Norwich Union | J. B. Pearce | do. |
| Making-up Netley and other Roads | Brentford Local Board | J. H. Strachan | do. |
| Additions to Sanatorium | Folkestone Corp. | J. White | do. |
| Street Works, Nelson-street | Aldershot Local Board | *Official* | do. |
| *Road-Making and Paving Works | Lewisham Bd. of Wks. | do. | do. |
| Paving, Kerbing, &c. Newstead-road | Plumstead Bd. of Wks. | do. | Oct. 4 |
| Well Sinking, Lusk, co. Dublin | Balrothery Union | do. | do. |
| *Painting Exterior of Workhouse | Hackney Union | do. | do. |
| Sixteen Houses, Elford-grove | Leeds Industrial Co-op. Soc. | Mr. Braithwaite | do. |
| Cottage, Powburn, near Alnwick | J. R. Carr-Ellison | Geo. Reavell | do. |
| Congregational Chapel, Newbridge, Mon. | ..... | Swash & Bain | do. |
| Granite Road Metal | Sutton (Surrey) L. B. | A. D. Greatorex | do. |
| Re-building "Bristol and Exeter" Inn, Weston-super-Mare | ..... | S. J. Wilde | do. |
| Pair of Villas, West Gravesend Estate | Kent & Essex Land, &c. Co. Lim. | Geo. R. Cobham | do. |
| Brick Sewers, Manholes, Denton-lane, &c. | Chadderton (Lancs.) Local Board | Jas. Diggle | Oct. 5 |
| Boiler House, Chimney, &c. | Horsham Local Board | G. Hodson | do. |
| Esplanade Extension, Broughton Ferry, N.B. | ..... | Alex. Scott | do. |
| Subway, &c. Liverpool-street Gasworks | Salford Corporation | *Official* | do. |
| Iron Building, Mount Pleasant, London, E.C. | Com. of H. M. Works | do. | do. |
| *Waiting Rooms, &c. Wellingborough | M. R. Co. | do. | Oct. 6 |
| *Extension of Engine Shed, Worcester | do. | do. | do. |
| Dwelling-house, Aspatria, Carlisle | J. Wilson | G. Armstrong | do. |
| *Reservoirs, Cast-iron Pipes, &c. | Chelmsford R.S.A. | J. C. Smith | Oct. 7 |
| *Small Houses and Shop, Oxford | Oxford Corporation | W. H. White | do. |
| Six Cottages and House, Bolton-road, Bradford, Yorks | ..... | J. Young | do. |
| Hospital, Ryton-on-Tyne | Ryton Parish Loc. Bd. | J. P. Dalton | Oct. 9 |
| Pier Works, Stranraer, N.B. | Portpatrick & Wigtownshire Joint Railways | R. Dundas | do. |
| Police Station, Bute-road | Cardiff Corporation | W. Harpur | do. |

## CONTRACTS—*Continued.*

| Nature of Work or Materials. | By whom Required. | Architect, Surveyor, or Engineer. | Tenders to be delivered. |
|---|---|---|---|
| Sewerage Works, Bilton Hill | Rugby U.R.S.A. | T. W. Willard | Oct. 9 |
| Road Metal | Leamington Corp. | *Official* | do. |
| Street Works, Champion-road, &c. | Leamington Twn Coun. | do. | do. |
| *New Infirmary | Dover Union | do. | Oct. 11 |
| Brick Sewers (1,500 yds.) &c. | Rochdale Corp. | S. S. Platt | do. |
| Iron Bridge, &c. Ullswater-street | Bolton Corp. | W. H. Brockbank | do. |
| Hospital, Mortuary, &c. Fishpool | Bolton Union | Woodhouse & Potts | Oct. 13 |
| Farm Buildings, Langford Hall, Essex | A. Lomas | F. M. Beaumont | do. |
| Sewering, Paving, &c. Carrs-street | Hurst (Lancs.) L.B. | Jos. Heys | do. |
| Sewerage Extension, &c. | Adlington Loc. Bd. | T. S. M'Callum | Oct. 14 |
| Water Supply and Drainage, Bowmore, N.B. | Islay Com. of Argyle County Council | W. R. Copland | do. |
| *Cottage, Sutton | South Metropolitan School District | E. W. Crickmay | Oct. 16 |
| Additions to Cottages, &c. at Gasworks | Cockermouth Loc. Bd. | *Official* | do. |
| Well Sinking, Wombourn | Bilston Imp. Com. | Baldwin Latham | Oct. 21 |
| *New School and Alterations | Petersfield (U.D.) Sch. Board | H. T. Keates | Oct. 24 |
| *Station Buildings, Footbridge, &c, Tilehurst | G. W. R. Co. | *Official* | do. |
| *Goods Shed, Briton Ferry | do. | do. | do. |
| Cattle Market, Glas Meadows | Denbigh U.S.A. | do. | Oct. 26 |
| Buildings at Sewage Works | Littleborough Loc. Bd. | do. | No date |
| Fire Station and Cottages | Ilkley Local Board | M. Hainsworth, Jun. | do. |
| Vestries at the Parish Church, Lostwithiel | ..... | Edmund Sedding | do. |
| Additions to Four Houses, Cecil-street, Carlisle | ..... | H. H. Hodgkinson | do. |
| Residence, Caerphilly | ..... | Bruton & Williams | do. |
| Two six-roomed Houses, near Birmingham | S. Hern | Ed. Eaden | do. |
| Alterations to Jewish Synagogue, New Briggate, Leeds | ..... | W. A. Hobson | do. |
| Two Houses, Argoed, Wales | L. Jenkins | ..... | do. |
| Residence, Ryhope, Sunderland | L. Wetherell | ..... | do. |
| *Re-laying Sewers, Overton | Ellesmere R.S.A. | W. Wyatt | do. |
| *Painting Works, Weymouth | War Department | *Official* | do. |
| *Children's Cottage Homes, &c. | Sheffield Union | C. J. Innocent | do. |

## PUBLIC APPOINTMENT.

| Nature of Appointment. | By whom Advertised. | Salary. | Applications to be in |
|---|---|---|---|
| *Assistant Surveyor | Civil Service Com. | ..... | Oct. 19 |

*Those marked with an Asterisk (*) are advertised in this number.* *Competitions, p.* iv. *Contracts, pp.* iv., vi., viii., *and* xxi. *Public Appointments, pp.* xviii. *and* xxi.

NOTICE OF REMOVAL.—We are asked to mention that the Albo-Carbon Light Company has this week removed its offices and show-rooms from 74, James-street, Westminster, to 28, Hatton-garden.

NEW RUSSIAN CHURCHES IN VIENNA.—According to the *Novve Vremja*, of St. Petersburg, the Russian Government has decided to build two new Russian churches in Vienna, at a cost of over 1,000,000 roubles, of which a sum of 400,000 roubles has been voted at once.

MESSENGER & COMPANY'S RADIATORS.—These radiators, which have recently been brought under public notice, are specially designed as an improvement on preceding examples of the apparatus now usually employed in the place of coils for heating. Their heating surface is believed by the manufacturers to be larger than that of any other radiators at present on the market, while the cost, owing to the simple way in which they are made, is comparatively low. As in some other forms, in these radiators the heat is distributed not only by radiation, but also by the more effective action of connexion by currents of air passing over the heated surface, thus rendering them capable of combination with certain kinds of ventilation schemes. A current of fresh air may be introduced into a room and warmed by passing through the centre of the radiator, or by closing a valve, the air in the room may be heated by circulation through the radiator. Thus, the temperature of the incoming air is under complete control, within, of course, the limits of the power of the radiator used. This power may be varied as desired, since the radiators are made up in single and double tubes of various ranges, the double one having from 48 to 96 ft. super. of heating surface, and the single one 24 to 48 ft., according to the number of tubes. They are also made in two sizes as regards height, one being 2 ft. 6 in. high, so as not to protrude above the level of the pews when used for heating churches and chapels, and the other 2 ft. 11 in. or 3 ft. high for use where desired. The width is only 5 in. for the single and 8½ in. for the double form. The radiators are also made up in circular, semi-circular, and quadrant shapes, as well as in hollow circles for placing round a column. The valves and connexions are placed in the base of the apparatus so that nothing unsightly appears on the exterior, and a certain amount of quiet, unobtrusive ornament is employed in the form of linen pattern moulding, by which they possess the merit of neat and compact appearance, and are a credit to the well-known manufacturers, Messrs. Messenger & Co., of Loughborough and London.

PROPOSED ESPLANADE AT COWES. — A Local Government Board inquiry was held at West Cowes on Wednesday morning relative to an application made by the Local Board for permission to borrow 2,300*l.* for the purpose of constructing an esplanade at Egypt on the boundary of the district. The inquiry was conducted by Mr. Arnold Taylor, and a good deal of public interest was manifested in the proceedings. Lord Colville of Culross and Mr. Hervey appeared to oppose the application on behalf of the Royal Yacht Squadron, and Mr. John Gretton, another Cowes resident, also opposed. It appeared from the evidence adduced on behalf of the Local Board that they proposed to expend the amount named on an esplanade extending from Egypt corner to the boundary of the district, and it was stated that the work of improvement would be carried out by Mr. Ward, the owner of the land, at his own expense, to an extent equal to the sum spent by the Local Board. The proposed wall is to be 640 ft. long, the width of the roadway being 40 ft., a footpath of 10 ft. width on one side and another of 6 ft. on the other, the carriage-road between being 24 ft. wide. The Board's Surveyor, Mr. Nelson F. Dennis, gave evidence in support of the application. Mr. John Gretton stated his grounds of objection, which were to the effect that, in consequence of the watery and slippery nature of the soil in the locality there would be an extraordinary pressure on the inner surface of the wall, and this, with the action of the sea on the outer surface, would make the wall a very expensive one for the ratepayers. It was pointed out that other walls had been standing near this spot for at least fifty years without showing signs of moving, and the Inspector reminded Mr. Gretton that in constructing this wall, due provision was to be made for carrying off the water on the adjacent land. Lord Colville of Culross said he had not a word to say against the attraction of the scheme, but he and Mr. Hervey, members of the Committee of the Squadron, opposed the scheme because it appeared to be a case of dealing with private property, and, therefore, the public money ought not to be used for the purpose. One or two ratepayers present expressed their disapproval, but the Chairman of the Local Board said he was not aware of any strong opposition to the scheme in the town. The Inspector, at the conclusion of the evidence, proceeded to view the spot where the proposed works are to be carried out.

PIECEWORK.—Mr. W. S. Johnson, locomotive superintendent of the Midland Railway Co., conducted a British Association excursion party over the locomotive works at Derby. He stated that a very large proportion of the nearly 4,000 men employed are on piecework. A certain amount of work in connexion with the building of an engine will be undertaken by a man, on certain terms, and he will provide his own assistance. The casting of chairs, on which rails rest, is piecework. Although the work is hard and exhausting, and involves a good deal of stooping and bending of the back, there is no doubt about the energy the men put into their work. There is no stopping to rest and talk, and this is attributed to the fact that they are not on wages, but are paid according to the number of chairs produced. At present the men are on short time, stopping from Thursday night till Monday morning.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION: ELECTION OF PENSIONER. — A special general meeting of the donors and subscribers, convened by advertisement, was held at the offices, 21, New Bridge-street, E.C., on Tuesday evening, September 26, when Mrs. Louisa Clark was elected by show of hands to the widow's pension of 20*l.* per annum. Mr. William A. Colls, the President, occupied the chair; a vote of thanks being accorded to him at the close of the business.

ELECTION OF BOROUGH SURVEYOR, PLYMOUTH. —The following selected candidates for the post of Borough Engineer and Surveyor, appeared before the members of the Council on the 25th inst.:—Thomas Raynes, 37, Senior Assistant Engineer to Water Department, Birmingham; John W. Witts, 37, Assistant City Surveyor to Leeds Corporation; J. Cardell Trounson, Plymouth, 37, Assistant Borough Engineer and Surveyor of Plymouth; Alfred Fidler, 31, Assistant Engineer to Borough of Blackburn; Henry A. Cutler, 32, Borough Surveyor of Rawtenstall; John Ed. Stafford, 41, Borough Engineer of Burnley; Adam H. Campbell, 32, Borough Surveyor of Stratford-upon-Avon; Jas. Wm. Welch, 35, Principal Engineering Assistant to City Surveyor of Manchester; Henry Richards, 40, Surveyor to the Mortlake District Board; John Ward, 39, Deputy City Surveyor of Sheffield; Harker Charles Crummack, 35, Borough Engineer and Surveyor of Hartlepool; J. H. Strachan, 29, Engineer and Surveyor of Brentford; James Paton, Town Hall, Birkenhead, 36, Assistant Borough Engineer and Surveyor of Birkenhead; F. W. Bricknell, Town Hall, Hull, 33, Assistant Borough Engineer of Hull. Mr. Paton received 35 votes, Mr. Trounson 4, and Mr. Witts and Mr. Richards 1 each. Mr. Paton was therefore declared elected. He has served under the Corporation of Birkenhead for fifteen years, and previously held an appointment at Liverpool.

ARCHÆOLOGICAL DISCOVERIES AT CARNARVON. —In the course of some restorations now being made at Llanbeblig Church, Carnarvon, several discoveries of considerable archæological interest have been made. A Perpendicular window has been found behind a gallery in the south transept. Underneath the window was a founders' tomb, and a piscina of the fourteenth century. The foundations of an altar were also discovered in the south transept. In the chancel, at the east end, was found in the wall a stone credence. A further discovery of a holy water stoup was made behind the door.

THE FRENCH STRIKE.—The books of the mining concerns in the North of France, says the *Western Mail*, show that the colliers in that region have been receiving from six to eight francs per day, so that in respect of wages, at least, they had no sort of justification for going out on strike. Indeed, according

to their own manifestoes, they are bent upon having in their own hands the virtual control of the mines, and the demand for higher pay was seemingly a kind of incidental after-thought. Employers of labour, who follow a business simply for the sake of the profit they can make out of it, could not be expected to make concessions which would take out of their hands the successful management of any commercial enterprise, while largely increasing their working expenses. But the miners of Northern France have lost no time in putting forth their utmost endeavours to induce the Belgian miners, who certainly are miserably paid, to follow their example. However, the French strike will have the effect of showing English and Welsh miners that in our monarchical country strikers are more indulged than in Republican America or Republican France. The French Minister of the Interior has flooded the district with soldiers, with instructions to rigidly enforce order.

THE EDINBURGH WATER SUPPLY.—It seems that in their last report to the Edinburgh and District Water Trust in regard to the proposed new source of supply, the consulting engineers modified their views as to the amount of money which will be required to be expended on the Manor scheme. Whereas formerly 10,000*l.* extra were required, they now state that *at least* 10,000*l.* extra would be required. In the conclusion of their report they practically abandon the Manor scheme, and unanimously recommend the Talla.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—We have received the annual calendar of this institution for 1893-4, in which we are glad to notice the innovation of a complete course of architectural lectures by Mr. Charles Gourlay, which are intended to assist in preparing students for the Institute Examinations. There is also an architectural studio under the supervision of Mr. Gourlay, Mr. James Lochhead being the Instructor. There are three courses of lectures on the History of Architecture, delivered weekly on Friday evenings. One period of architecture will be more fully treated in each year; the period for the ensuing year is the "English Renaissance." The lantern will be used occasionally throughout the session in all the courses. The class for measuring and sketching at Glasgow Cathedral will meet from April till October, from 2 p.m. till 6 p.m. on Saturday afternoons. This class has been very well attended, and much good work has been done. In each of the stages in Building Construction there will be two lectures weekly of fully one hour in each. The rooms in which the classes meet have been much improved, and are now well suited for the work.

LEAVING WORK WITHOUT NOTICE.—As a result of the strike at Hebburn-on-Tyne Colliery, 486 miners were summoned at South Shields for illegally absenting themselves from work. When the case had been opened they admitted they were in the wrong, and consented to pay a lump sum of 312*l.* 15s. as damages.

NEW MARKET, FORRES.—The following are the successful contractors for the alterations and improvements about to be made on the New Market, and for which Messrs. A. & W. Reid, Elgin, are architects:—Carpenter, George Forrest; plumber, Alexander Laing; plasterer, John Nairn, jun.; painter, Wm. Fordyce; slater, Alexander Forbes, all of Forres.

THE ELECTRIC LIGHT AT BRIGHTON.—The inauguration of the electric light on the western portion of the marine promenade at Brighton was performed on Saturday evening by the Mayoress, Miss Ewart, on a platform at the base of one of the lamps. Alderman Moon, the Chairman of the Lighting Committee, explained that this was the first instance of the low-tension system being applied to street lighting on anything like such a considerable scale, and that this was only the beginning of street lighting by electricity. He then asked the Mayoress to switch on the light, which was done, by lowering the handle at the base of the pillar, and five of the arc lamps that crown the ornamental pillars at a height of 28 ft., were lighted. As the light can only be switched on to five lamps at a time, men in the employ of the Corporation were deputed to turn on the light at the other thirty-five lamps, and they were lighted almost simultaneously. One or two of the lamps went out at the early part of the evening, but the defects were speedily adjusted, and they afterwards burnt steadily. The cost will be about 1,200*l.* per annum, or 300*l.* a year more than for gas.

PROPERTY SALES, 1893.—As we have announced from time to time, several large properties, some of them comprising historical seats, were placed in the market last season. So infrequent proved the sales at auction that the season has been characterised as one of unprecedented depression. On the other hand, a few of the best properties soon found purchasers by private contract. We learn, for instance, that Mr. John Lysaght, of Bristol, has bought Hengrave Hall, with 4,500 acres, and a mansion built in 1525 by Sir Thomas Kytson, a London merchant; and that Mr. Harrison, of Liverpool, and Mr. W. N. Champion, of Cantley Hall, Doncaster, have become owners, respectively, of the Lecourt Estate, Hampshire, and Ridlesworth, near Thetford. The latter passed to the families of Mealing, Roos, and Drury, in succession. Sir Drue Drury, of Linsted, gentleman-usher to Queen Elizabeth, was the first of his house to settle here, on his marriage with the daughter and heiress of Sir Philip Calthorpe. Sir Drue rebuilt the hall, and there he died, 1617. His descendant, Sir Robert Drury, Bart, died *s.p.* in 1712, so the estate passed to his sister, whose son, Sir Wm. Wake, sold it to Sylvanus Bevan. Bevan pulled down the old house, replacing it with one of white brick and stone dressings of two floors in the Classic style, as depicted in Neale's "Seats," 1st Series, vol. iii. (1820). In Blomefield's "Norfolk," (1805) is a description of two curious pictures here: a portrait of Sir Wm. Drury, Lord Justice of Ireland, who died in 1579, and a plan of Edinburgh Castle, with two armies before it, inscribed "Sir William Drurye Knight, Generall of the Englishe, wanne Edenburghe Castle, 1573"; around the picture are the arms and names of his companions at the siege, amongst them being those of Mr. Henry Killegray, ambassador (with the Killegrew blazon), Sir George Carey, Sir Henry Lee, and Sir William Killegray.

## MEETINGS.

MONDAY, OCTOBER 2.

*Society of Engineers* (Town Hall, Westminster).—Paper on "Gas Substitutes," by Professor Vivian B. Lewes, F.I.C. 7.30 p.m.

TUESDAY, OCTOBER 3.

*Sanitary Institute.*—Lecture on "Ventilation, Warming, and Lighting," by Sir Douglas Galton, K.C.B., &c. 8 p.m.

*Glasgow Architectural Association.*—Paper on "Symbolism in Architecture," by Mr. Walter R. Watson. 8 p.m.

WEDNESDAY, OCTOBER 4.

*Foremen and Clerks of Works' Provident Institution.*—Ordinary Meeting. 8.30 p.m.

FRIDAY, OCTOBER 6.

*Sanitary Institute.*—Lecture on "Principles of Calculating Areas, Cubic Space," &c. By Mr. H. Law. 8 p.m.

SATURDAY, OCTOBER 7.

*Northern Architectural Association.*—Outdoor Meeting, Durham College of Science, Barras Bridge. 2.30 p.m.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Visit to Sewage and Destructor Works, Ealing. 3 p.m.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

17,760.—SECURING WINDOW-SASHES: *J. Pollock.*—The main parts of the appliance are a screwed stem, a pedestal or barrel, and a projecting finger secured by a locking nut. These operate together to form a lock fastening for sashes.

18,044.—FASTENINGS FOR DOORS: *H. Haynes.*—On the handle of the door is fixed a stem, and at the end farthest from the handle is a locking piece into which the stem slides. This locking piece has a revolving stem, which is the essential feature of the invention.

19,195.—COVERING FOR SEATS OF WATER-CLOSETS: *P. G. H. Dop* (Utrecht).—The protective covering consists of suitable sheet material, such as paper, with an opening to correspond to that in the seat. The edge portion is made of two or more thicknesses of material cut or slit so as to form a number of flaps, each of which is opposite to the cut or slit between two of the flaps of the adjacent sheet of material, so that when the covering is applied to a seat, the flap portions can be turned downward so as to completely cover the edge of the opening in the seat.

19,206.—WOOD-SAWING MACHINERY: *J. & G. Pickles.*—Several improvements and combinations of working parts are effected in order that the parts may be put out of the way of the attendant, and changes in feed may quickly be made.

22,989.—VENTILATING: *D. Baron.*—An enclosed channel or casing, having the appearance of a beam, is placed across the room. One end is closed, the other is in communication with an air-flue or with the outer atmosphere. Openings in the casing provide for the inlet of foul air, and these openings have deflecting plates arranged to direct the current of foul air along the channel to the air-flues, each orifice helping to induce the foul air to enter through the remaining orifices as its current of foul air passes it on its way to the air-flue.

13,936.—WOOD-GRAINING MACHINES: *J. Shannon.*—Rollers are made with cuts or indentations closely copied from the natural wood. The object of the invention is to take strips of the natural wood, and use them to form the actual pattern for the imitation in painting, or such like process, of the woods themselves.

### NEW APPLICATIONS FOR LETTERS PATENT.

SEPTEMBER 11.—17,023, T. Barker, Water Waste Preventer for Closet Cisterns.—17,038, J. Logan, Window Silencer.—17,046, C. Allison, Preparing and Seasoning Timber.—17,065, H. Snell, Drain Pipes, &c.

SEPTEMBER 12.—17,082, R. Dobbie, Kitchen or Cooking Ranges.—17,142, L. Grote, Artificial Stone.—17,169, W. Wilson and W. Priest, Manufacture of Paints.

SEPTEMBER 13.—17,162, E. Jeffcote and J. Bates, Gullies, Traps, Syphons, &c.—17,170, J. Crosthwaite, Stoves for Heating Rooms, &c.—17,204, J. Held, Hinges for Doors.—17,227, L. Forsberg, Planes.—17,241, T. Dunans, Fastening and Securing Window Sash-frames.

SEPTEMBER 14.—17,283, J. Cochrane, jun., Window Sashes.—17,322, A. McLean and C. Wilson, Artificial Stone.—17,331, A. Mary, Processes for the Production of White Lead.

SEPTEMBER 15.—17,342, J. Mather, Flushing Cisterns.—17,344, J. Mather, Ball Taps.—17,364, E. Hughes, Ventilating.

SEPTEMBER 16.—17,411, W. Scott-Morton, Ornamental Materials for Decorating Walls, Ceilings, Floors, &c.—17,446, C. Horton, Water-closets.—17,500, J. Robinson, Buffer or Recoil Apparatus Applicable to Swing-spring Doors.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

14,595, H. Hall, Tiles for Lining or Facing Walls, and other Surfaces.—14,718, J. Judd, Expanding and Contracting Door, Window, Shop Front, Guards, &c.—14,882, K. Cornish and J. Cassavetti, Glazed Earthenware and Metallic Facings to Bricks, Tiles, and Concreted Surfaces.—15,384, J. Martin, Making Glazed Bricks, &c.—15,637, C. Major, Roofing Tiles.—15,792, J. Mortimer, Socketed and Lidded Access Drain and Water-pipes.—15,837, A. Bell, Doors.—16,415, W. Burr, Fireproof Ceilings.—16,419, W. Allen, Chimney Cowls.—16,613, A. Henström, Ventilating or Chimney Top.—16,703, J. Walton, White Lead.

### COMPLETE SPECIFICATIONS ACCEPTED.

*(Open to Opposition for Two Months.)*

18,048, J. Parker, Manufacture of Mantels from Metal, Stone, Slate, &c.—20,169, J. Bainbridge, Chisels and like Instruments or Tools, particularly in securing them to their Handles.—21,061, C. Sümmermann, Air-tight Closing Windows.—1,645, J. and J. T. Wilson, Chimney and other Cowls.—12,063, J. Jones and Others, Water-waste Preventers.—13,026, J. Howard, Building Blocks or Bricks.—15,348, J. Dandy, Pipe for Drains, &c.

## SOME RECENT SALES OF PROPERTY.

### ESTATE EXCHANGE REPORT.

SEPTEMBER 20.—By *Messrs. Aldridge:* 119, Bensham Manor-road, Thornton Heath, f., 460*l.*—By *D. Young:* 86, 88, Hargwyne-street, Brixton, u.t. 81 yrs., g.r. 11*l.*, 505*l.*—By *Stimson & Sons:* 25, 54, Loder-street, Old Kent-road, u.t. 88 yrs., g.r. 10*l.* 10s., 595*l.*; 12, 14, 16, Galley Wall-road, Bermondsey, u.t. 63 yrs., g.r. 9*l.*, 770*l.*; 47, 49, Reverdy-road, Bermondsey, u.t. 46 yrs., g.r. 9*l.*, 530*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

## PRICES CURRENT OF MATERIALS.

| TIMBER. | | |
|---|---|---|
| Greenheart, B.G. ton | 9/0/0 | 0/0/0 |
| Teak, E.I. load | 9/10/0 | 15/0/0 |
| Sequoia, U.S.ft.cu | 2/3 | 2/6 |
| Ash, Canada load | 2/5/0 | 3/10/0 |
| Birch, do. | 2/15/0 | 3/15/0 |
| Elm, do. | 3/0/0 | 4/5/0 |
| Fir, Dantsic, &c. | 1/5/0 | 2/15/0 |
| Oak, do. | 2/15/0 | 5/5/0 |
| Canada | 5/15/0 | 7/5/0 |
| Pine, Canada red | 2/5/0 | 2/15/0 |
| Do. Yellow | 2/5/0 | 4/10/0 |
| Lath, D'ntsic, fath | 4/10/0 | 5/10/0 |
| St. Petersburg.. | 5/0/0 | 6/10/0 |
| Wainscot, Riga, &c., log | 2/15/0 | 5/0/0 |
| Odessa, crown | 2/15/0 | 5/0/0 |
| Deals, Finland and 1st std 100 | 7/0/0 | 9/10/0 |
| Do. 4th & 3rd | 6/10/0 | 7/0/0 |
| Do. Riga | 7/0/0 | 8/10/0 |
| St. Petersburg, 1st yellow | 9/0/0 | 12/10/0 |
| Do. 2nd yellow.. | 7/0/0 | 8/0/0 |
| Do. white | 8/0/0 | 10/10/0 |
| Swedish | 7/0/0 | 15/0/0 |
| White Sea | 7/0/0 | 15/10/0 |
| Canada, Pine 1st | 21/10/0 | 28/10/0 |
| Do. do. 2nd | 16/0/0 | 17/10/0 |
| Do. do. 3rd &c. | 7/10/0 | 10/5/0 |
| Do. Spruce, 1st | 8/10/0 | 10/10/0 |
| Do. do. 3rd & 2nd | 6/10/0 | 7/15/0 |
| New Brunswick | 6/0/0 | 7/5/0 |
| Battens, all kinds | 3/0/0 | 15/0/0 |
| Flooring boards, sq., 1 in. prep. 1st | 0/9/6 | 0/14/0 |
| Do. 2nd | 0/7/6 | 0/11/6 |
| Other qualities— | 0/4/6 | 0/7/0 |
| Cedar, Cuba ..ft. | /4 | /4½ |
| Honduras, ..&c | /4 | /4½ |
| Mahogany, Cuba | /4 | /6½ |
| St. Domingo, cargo av. | /3 | /6 |
| Mexican do. do. | /3½ | /4½ |
| Tobasco do. do. | /3½ | /6 |
| Honduras do. .. | /4 | /5½ |
| Box, Turkey ton | 4/0/0 | 13/0/0 |
| Rose, Rio | 9/0/0 | 20/0/0 |
| Bahia | 8/0/0 | 18/0/0 |
| Satin, St. Doming | 0/0/6 | 0/1/3 |

| TIMBER (*continued*). | | |
|---|---|---|
| Satin, Porto Rico | 0/0/7 | 0/1/6 |
| Walnut, Italian | 0/0/3½ | 0/0/7 |
| **METALS.** | | |
| Iron—Pig, in Scotland ton | 2/2/5½ | 0/0/0 |
| Bar, Welsh, in London | 5/17/6 | 6/0/0 |
| Do. do. at works in Wales | 5/7/6 | 5/10/0 |
| Do. Staffordshire, in London | 6/0/0 | 6/10/0 |
| COPPER—British, cake and ingot | 45/15/0 | 46/5/0 |
| Best selected | 46/15/0 | 47/5/0 |
| Sheets, strong | 54/0/0 | 0/0/0 |
| Chili, bars | 41/17/6 | 42/5/0 |
| YELLOWMETAL lb | 0/0/4½ | 0/0/5 |
| LEAD—Pig, Spanish ton | 9/15/0 | 9/16/3 |
| English, com. brands | 9/16/3 | 9/18/9 |
| Sheet, English, 6 lbs. per sq. ft. and upwards | 10/10/0 | 10/15/0 |
| Pipe | 12/0/0 | 0/0/0 |
| ZINC—English sheet ton | 20/5/0 | 20/10/0 |
| Vieille Montagne | 0/0/0 | 0/0/0 |
| TIN—Straits | 79/10/0 | 80/0/0 |
| Australian | 81/10/0 | 82/0/0 |
| English Ingots | 85/0/0 | 85/10/0 |
| Banca | 88/0/0 | 0/0/0 |
| Billiton | 82/0/0 | 0/0/0 |
| **OILS.** | | |
| Linseed ton | 21/2/6 | 21/7/ |
| Cocoanut, Cochin | 31/0/0 | 0/0/0 |
| Do. Ceylon | 26/15/0 | 0/0/0 |
| Palm, Lagos | 26/12/0 | 0/0/0 |
| Rapeseed, English pale | 23/15/0 | 24/0/0 |
| Do. brown | 22/5/0 | 22/10/0 |
| Cottonseed ref. | 22/5/0 | 0/0/0 |
| Oleine | 23/10/0 | 24/10/0 |
| Lubricating, U.S. | 4/0/0 | 5/0/0 |
| Do. refined | 5/10/0 | 12/0/0 |
| TAR—Stockholm barrel | 0/12/6 | 0/0/0 |
| Archangel | 0/12/6 | 0/0/0 |

## TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*

ASHBY-DE-LA-ZOUCH.—For the erection of an isolation hospital at the workhouse, for the Union Guardians. Mr. Jno. W. Metcalf, C.E., Surveyor, 31, Tamworth-road, Ashby-de-la-Zouch:—

| | | | |
|---|---|---|---|
| Ernest Clark | £795 | Henry Slater | £677 |
| E. Orton | 769 | J. T. Bellamy | 670 |
| T. Shaw | 748 | T. Fish | 654 |
| Orton & Son | 684 | Thos. Buck, Ashby-de-la-Zouch (accepted) | 637 |
| T. Orton | 681 | | |

ASTON.—For erecting three cottages in Mansfield-road, Aston, for Mrs. Joseph Hill. Mr. W. T. Foulkes, architect:—

| | | | |
|---|---|---|---|
| C. Bampfield | £715 10 | Greenwood | £660 0 |
| Esau Smith | 698 10 | Stone (accepted) | 650 0 |

BLACKPOOL.—For rebuilding St. John's Market, for the Corporation. Mr. J. Wolstenholme, Borough Engineer, Blackpool:—

| | | | |
|---|---|---|---|
| Moore Bros. | £11,868 0 0 | Craven & Sons | £10,950 0 0 |
| W. Brown & Sons | 11,475 0 0 | W. H. Dean & Son, Blackpool* | 10,699 3 4 |
| S. & J. Whitehead | 11,450 0 0 | | |

*Accepted.

BRADFORD (Yorks).—Accepted for the erection of shed, &c., for Mr. Shaw. Messrs. F. Beanland & Co., architects, Ivegate Chambers, Bradford:—

*Excavators, Masons, and Bricklayers.*—A. Broxup & Son, Bradford ..... £1,160 0 0
*Carpenter and Joiner.*—James Deacon, Shipley ..... 410 0 0
*Ironfounders.*—Thornton & Crebbin, Bradford ..... 861 0 0
*Plumbers and Glaziers.*—R. S. Abbot & Son, Bradford ..... 120 0 0
*Plasterer.*—L. Firth, Eccleshill ..... 82 0 0
*Slaters.*—Hill & Nelson, Bradford ..... 148 0 0
*Painter.*—George Scott, Bradford ..... 52 0 0

BRENTWOOD (Essex).—For laying sewers, &c., in Ongar-road, Brentwood, for the Parochial Committee. Mr. A. T. G. Woods, surveyor, New-road, Brentwood:—

W. Catley ..... £145 0 0
B. Claydon, Queen's-road, Brentwood (accepted) ..... 137 14 6

BRISTOL.—For the erection of school buildings, South-street, Bedminster, for the School Board. Mr. W. V. Gough, architect, 24, Bridge-street, Bristol:—

| | | Extras. |
|---|---|---|
| Enos Gay | £12,450 0 0 | £180 |
| Beachim & Balmont | 12,393 0 0 | 177 |
| W. Church | 12,188 0 0 | 195 |
| J. E. Davis | 11,945 0 0 | 150 |
| G. Downs | 11,719 0 0 | 189 |
| E. Walters | 11,680 0 0 | 120 |
| Krauss | 11,633 0 0 | 190 |
| G. Humphreys | 11,522 0 0 | 186 |
| Cowlin & Sons | 11,170 0 0 | 197 |
| J. Perrott | 10,694 0 0 | 96 |
| H. J. Kossiter | 10,848 0 0 | 148 |
| C. A. Hayes | 10,797 0 0 | 170 |
| G. H. Wilkins | 10,250 0 0 | 199 |
| A. J. Beaven | 10,200 0 0* | 160* |

[All of Bristol.]

*Plumbers' Work.*

Chivers & Son, Bedminster ..... £515 0 0*

* Accepted.

COVENTRY.—For the erection of a factory in Priory-street, for the "Triumph" Cycle Company, Limited. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry. Quantities by Mr. J. Gardiner, Much Park-street, Coventry:—

| | | | |
|---|---|---|---|
| A. A. Wincott | £3,015 | Liggins & Strong | £2,651 |
| William Bishop | 2,929 | J. Worwood | 2,567 |
| C. Gray Hill | 2,867 | C. Garlick, Coventry* | 2,555 |
| Charles Haywood | 2,815 | | |

* Accepted.

CROUCH END.—For the erection of Manual Instruction Building for Boys, and additions to the Girls' Department, at the Board Schools, Crouch End, for the School Board for Hornsey. Messrs. T. Chatfeild Clarke & Son, architects, 63, Bishopsgate-street Within, E.C.:—

| | | | |
|---|---|---|---|
| Rider & Son | £2,580 | E. Lawrence & Sons | £2,467 |
| Charles Cox | 2,535 | W. C. Nightingale | 2,427 |
| Colls & Sons | 2,530 | Matlock Bros. | 2,391 |
| Hall, Beddall, & Co. | 2,530 | C. Wall | 2,380 |
| Woodward & Co. | 2,483 | Brown, Son, & Blomfield | 2,295 |
| Patman & Fotheringham | 2,473 | | |

DURHAM.—For alterations, &c., to "Wheatsheaf" Inn, Elvet Bridge, for Mr. S. Smith. Mr. G. Ord, architect, 16, The Avenue, Durham. Quantities by Messrs. Boreham & Morton:—

Isaac Oates ..... £652 13 0
F. Caldcleugh, Durham (accepted) ..... £620 0 0

*Plumber.*

James Laidlen ..... £114 2 0 | N. W. Almond ..... £97 0 0

*Painter.*

T. Hopper & Son ..... £58 6 6½ | G. Smurthwaite & Son £56 0 0

*Plasterer.*

T. Nesbitt ..... £36 10 0

GRAVESEND.—Hospital. Messrs. Farrow & Nisbett, 7, New-court, Carey-street, Lincoln's Inn, architects:—

| | | | |
|---|---|---|---|
| J. M. Dering | £6,735 10 | W. H. Archer | £5,284 0 |
| R. Avard | 6,237 16 | Wall & Co. | 5,217 0 |
| Tompsett & Kingham | 5,867 0 | Multon & Wallis | 5,191 0 |
| W. Tuffee | 5,386 0 | L. Seager | 4,827 0 |

GRIMSBY.—For the erection of a Church Institute for the district of All Saints, Weelsby. Mr. J. J. Cresswell, architect:—

| | | | |
|---|---|---|---|
| J. A. Thomas | £1,183 7 1 | Thos. Wilkinson, Highgate, Cleathorpe (accepted) | £1,007 0 0 |
| Hewins & Goodhand | 1,139 0 0 | | |
| Thompson & Sons | 1,049 0 0 | | |

HARTLEY WINTNEY (Hants).—For providing and laying two miles of 3-in. cast-iron water-pipes, &c., for the Rural Sanitary Authority. Mr. J. R. Sisterson, Surveyor, Fleet, Hants:—

| | | | |
|---|---|---|---|
| C. S. Mallet | £854 3 10 | H. Blacknell | £544 13 6 |
| Hart & Sons | 772 0 0 | J. Kinchington | 528 14 8 |
| Peatis & Axwell | 695 0 0 | J. Talbott | 512 0 0 |
| Portsmouth Water Fittings Co. | 654 17 10 | Merryweather & Sons | 510 0 0 |
| Hughes & Gotto | 653 12 10 | H. Smith | 501 5 6 |
| Free & Sons | 650 0 0 | D. H. Porter | 499 15 0 |
| L. Faulkner & Sons | 630 0 0 | B. C. Badham & Co. | 497 12 0 |
| Claridge & Bloxham | 595 0 0 | Pool & Son, Hartley Wintney* | 496 0 0 |
| L. H. Green | 587 5 6 | | |
| Briggs, Wall, & Co. | 582 0 0 | J. Cattel | 480 0 0! |
| Clay Cross Co. | 559 10 0 | | |

* Accepted on account of local labour.

HEREFORD.—For the erection of stables or Mr. W. Shorten. Mr. G. H. Godsell, architect, Hereford:—

| | | | |
|---|---|---|---|
| Andrews & Son | £170 | J. Tristram | £161 |
| R. Taylor | 164 | J. Lloyd (accepted) | 128 |

*Flooring for same.*

| | | | |
|---|---|---|---|
| Andrews & Rudge | £60 15 6 | J. Lloyd (accepted) | £46 17 0 |
| Geo. Williams | 51 10 0 | | |

HEREFORD.—For the erection of arm buildings at Okeleigh, Broomy Hill. Mr. G. H. Godsell, architect, Hereford:—

R. Andrews & Son ..... £385 0 0

HEREFORDSHIRE.—For alterations and additions to Grafton House. Mr. G. H. Godsell, architect, Hereford:—

| | | | |
|---|---|---|---|
| Andrews & Rudge | £240 | T. Lewis | £185 |
| James Davies | 210 | James Lloyd (accepted) | 185 |

HEREFORDSHIRE (Pontrilas).—Accepted for alterations and additions to Little Howton Farm House. Mr. G. H. Godsell, architect, Hereford:—

James Davies ..... £250 0 0

LONDON, E.C.—For Portland and Westwood stone front to 7, and 71, Warwick-lane, E.C. Mr. Delissa Joseph, architect, 17, and 18, Basinghall-street, E.C.:—

| | | | |
|---|---|---|---|
| Wimpey & Co. | £565 0 0 | Webber & Corben | £500 0 0 |
| J. & D. Crew | 550 0 0 | G. Herridge* | 475 0 0 |
| F. J. Barnes | 512 12 6 | | |

*Amended and accepted at ..... £440 0 0

*For Constructional Ironwork.*

| | | | |
|---|---|---|---|
| Mr. T. Shaw & Co. | £65 15 0 | Drew, Bear, & Co.* | £59 4 0 |
| R. Moreland & Sons | 62 0 0 | | |

*Accepted.

LONDON.—For shoring up, pulling down, and rebuilding 6, St. Martin's-street, Leicester-square, for Mr. R. Borwick. Mr. A. M. Ridge, architect, 124, Newgate-street, E.C.:—

G. S. Archer, City-road (accepted) ..... £1,100 0 0
[No competition.]

LONDON.—For rebuilding 5, St. Martin's-street, Leicester-square, for Mr. S. G. Foulkes. Mr. C. J. Marshall, architect, 7, Gt.-Queen-street, Westminster:—

G. S. Archer, City-road (accepted) ..... £985 0 0
No competition.]

LONDON.—For partly rebuilding Messrs. Child's Bottled Ale Stores, Whitcomb-street, Leicester-square. Mr. Vincent J. Grose, architect, 13, Railway-approach, London Bridge. Quantities by Mr. J. M. Kennard, 13, Railway-approach:—

G. S. Archer, City-road (accepted) ..... £395 0 0
[No competition.]

LUTON.—For new warehouse King-street, Luton. Mr. B. Ware. Mr. W. J. Pearson, architect, Market-hill, Luton:—

| | | | |
|---|---|---|---|
| W. Dunham | £990 | T. & E. Neville, Luton* | £572 |
| G. Smart | 988 | | |

* Accepted.

MANSFIELD.—For laying 12-in. pipe sewer, Nottingham-road, Mansfield, for the Corporation. Mr. R. Frank Vallance, Borough Surveyor:—

| | | | |
|---|---|---|---|
| Edward Cuddy | £221 0 0 | James Bradley | £180 10 0 |
| H. Baker | 190 1 6 | W. A. Vallance, Mansfield* | 160 0 0 |
| J. W. Fisher | 183 10 0 | | |

* Accepted.

MANSFIELD.—Accepted for erecting Branch Bank for Nottingham Joint Stock Bank, Limited. Mr. R. Frank Vallance, architect, Mansfield:—

Thos. Fish & Sons, Nottingham ..... £2,625 0 0
[Eight tenders received.]

MANSFIELD.—Accepted for manager's house, Gas Works, for Mansfield Corporation. Mr. R. Frank Vallance, architect, Mansfield:—

Bradley & Roe, Mansfield ..... £397 10 0
[Eight tenders received.]

MOUNTAIN ASH (Glam.).—For sewering, paving, flagging, &c., High-street, Ynysybwl, for the Local Board. The Surveyor, Town Hall, Mountain Ash:—

| | | | |
|---|---|---|---|
| Thos. Richard | £414 4 6 | Evan Davies, Fanhalog, Ynysybwl* | £270 7 0 |
| Edwd. Williams | 274 11 4 | | |

* Accepted.

NEWBRIDGE-ON-WYE.—For the construction of new waterworks for the Rhayader Rural Sanitary Authority. Mr. Telfer Smith, surveyor, Builth Wells. Quantities by the surveyor:—

| | | | |
|---|---|---|---|
| H. Welsh | £1,594 0 0 | T. J. Davies | £1,000 0 0 |
| E. Thomas | 1,485 0 0 | J. E. Nott & Co. | 999 19 6 |
| J. Preece | 1,271 9 10 | S. W. Deakins | 997 0 0 |
| H. I. Davenport | 1,117 12 0 | J. M. Willis | 848 2 0 |
| T. D. Clerke | 1,096 10 0 | C. J. Downs & Co., Builth* | 818 8 9 |
| Marpole & Son | 1,077 0 0 | | |

* Accepted.

NOTTINGHAM.—For the erection of a branch police-station and house, Sneinton Hermitage, for the Watch Committee. Mr. A. Brown, C.E., Borough Engineer, Guildhall, Nottingham:—

| | | | |
|---|---|---|---|
| J. F. Price | £2,391 0 0 | J. Whittaker | £2,160 0 0 |
| Appleby & Lambert | 2,362 12 0 | Dennett & Williamson | 2,100 0 0 |
| J. H. Vickers | 2,295 0 0 | J. Barlow | 2,099 15 6 |
| A. B. Clarke | 2,250 0 0 | H. Vickers, Waterway-street, E., Nottingham* | 2,050 0 0 |
| J. Attenborrow | 2,227 6 10 | | |
| F. Wartnaby | 2,216 10 0 | | |
| W. Maule | 2,210 0 0 | | |
| J. G. Thomas | 2,197 0 0 | | |

* Accepted.

PENRITH.—Accepted for the erection of shops, stables, &c. (two contracts), for Mr. W. Hetherington. Mr. H. Higginson, architect, 20, English-street, Carlisle. Quantities by the architect:—

*Excavators', Masons', Bricklayers', and Carpenters' and Joiners' Work.*

William Grisenthwaite, Penrith ..... £1,690 0 0

*Slaters' Work.*

William Grisenthwaite, Penrith ..... 107 0 0

*Plumbers', Plasterers', and Painters' and Glaziers' Work.*

Jos. Dixon, Penrith ..... 265 0 0

RUNCORN.—For the erection of vagrants' ward at the workhouse, Dutton, for the Union Guardians. Mr. Percy Silcock, architect, Egypt-street, Warrington:—

| | | | |
|---|---|---|---|
| R. W. Collin | £375 | Jos. Houghton | £356 |
| Wm. Beckett | 357 | Thos. Davies, Frodsham* | 335 |

* Accepted.

SOUTHBOROUGH.—For sewerage works, roads, &c., for the Local Board:—

| | Pumping Station. | High Broms-road. | Meadow-road. | Bedford-road. |
|---|---|---|---|---|
| Edward Steer | £425 10 8 | £826 5 8 | £259 0 2 | £198 9 6 |
| John Jarvis, Tunbridge Wells | 464 5 5* | 612 18 0* | 273 6 0* | 196 17 6* |
| W. H. Wheeler | 469 8 4 | 644 2 6 | 250 19 0 | 181 8 0 |
| W. E. Constable | — | — | 281 3 7 | 209 2 1 |
| E. B. Chittenden | — | 744 1 8 | 299 17 8 | 220 10 10 |
| H. R. Brown | 455 10 0 | — | — | — |

* Accepted.

STOKE-UPON-TRENT.—For providing and fixing ironwork or Trent Bridge improvement, for the Corporation. Mr. Wm. Bowen, Borough Surveyor, Town Hall, Stoke-upon-Trent:—

| | | | |
|---|---|---|---|
| Woodhouse & Rawson & Co. | £395 0 0 | Kerr, Stuart, & Co. | £310 0 0 |
| Renshaw & Co. | 345 0 0 | Dean & Lowe, Stoke-on-Trent (accepted) | 306 10 7 |

TRURO.—For the erection of a villa residence, Tregollo-road, for Mr. E. Benney. Mr. Sampson Hill, architect, Redruth:—

| | |
|---|---|
| Geo. Farley & Co. | £673 0 0 |
| Gilbert & Walters | 637 10 0 |
| John Higgins, Truro (accepted) | 600 0 0 |

*Masonry, &c.*

| | |
|---|---|
| Geo. Farley & Co., Truro | 423 0 0 |

*Carpentry, &c.*

| | |
|---|---|
| W. H. Moyle, Chacewater | 258 0 0 |

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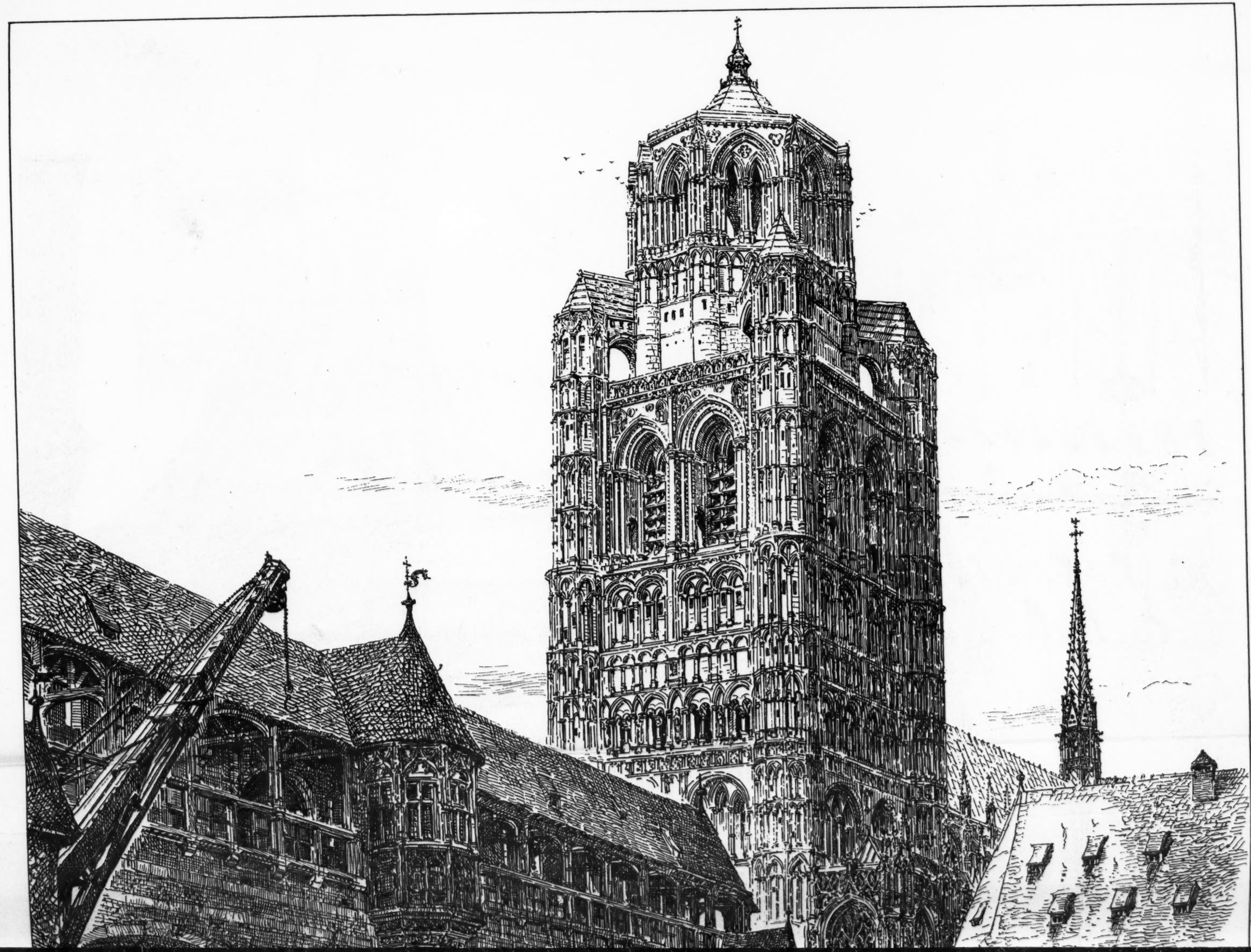

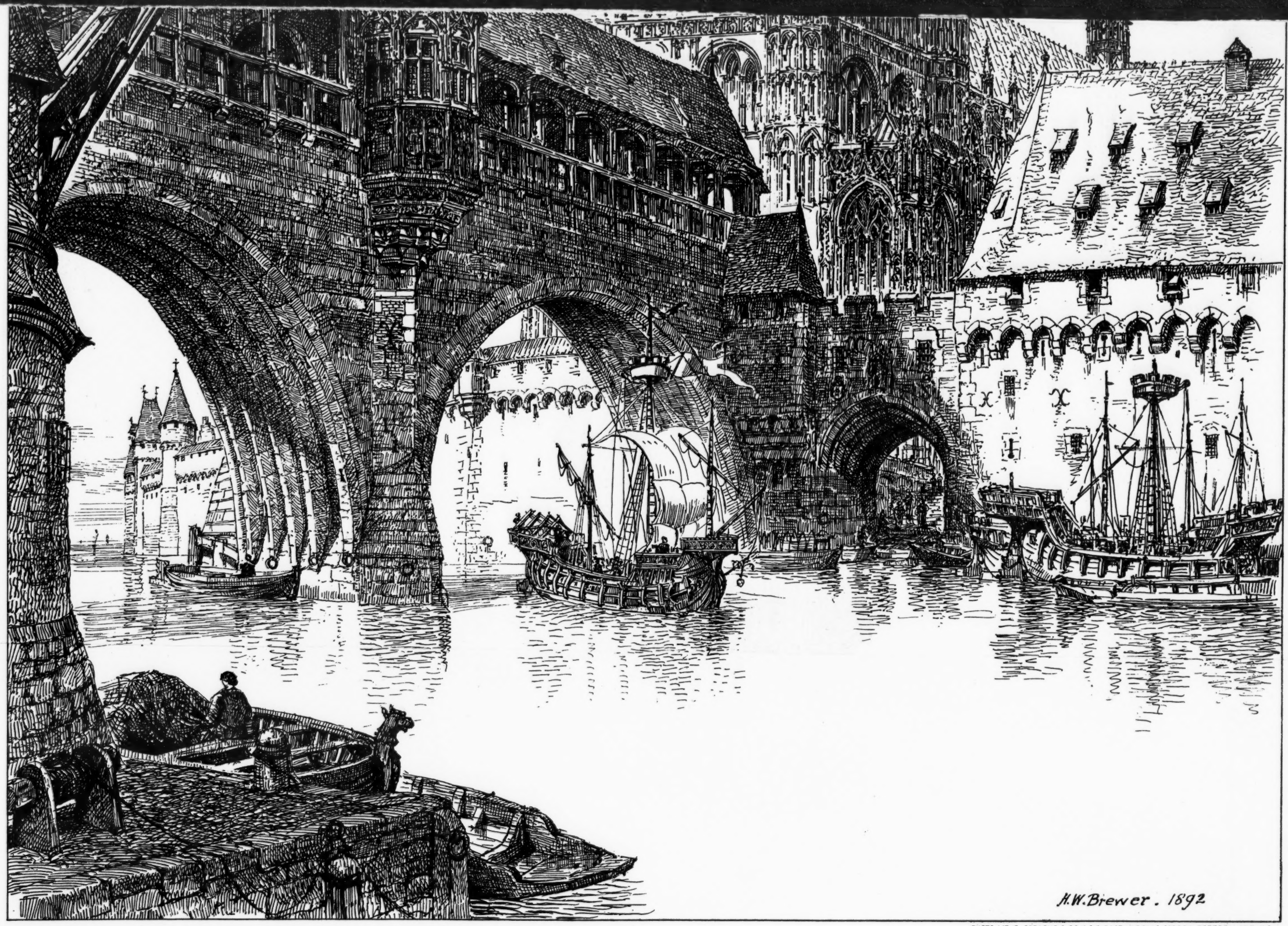


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AN ANCIENT HARBOUR.

VISITORS' STAIRCASE, "AVERY HILL," ELTHAM.—Mr. Thomas W

*Royal Academy Exhibition, 1893.*

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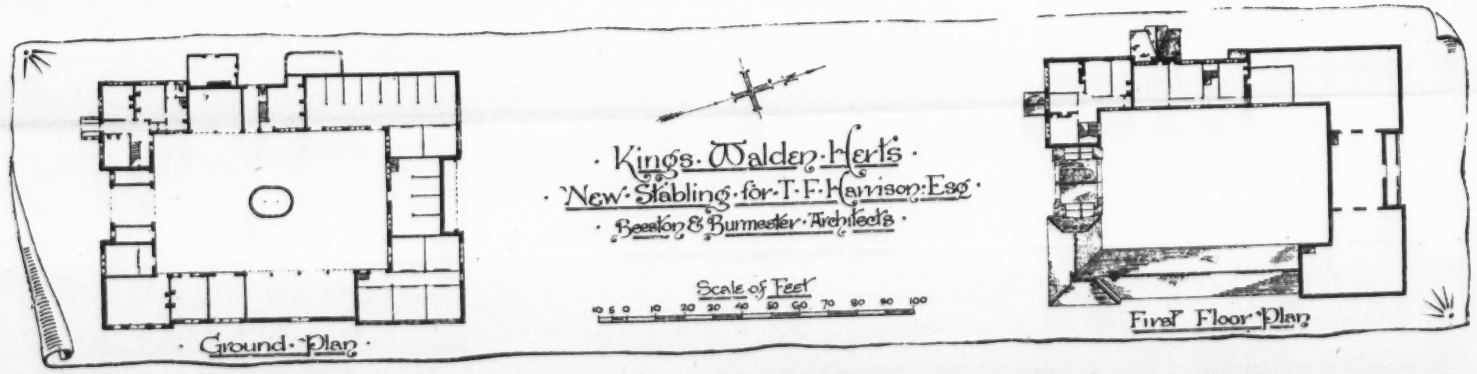
L," ELTHAM.—Mr. Thomas W. Cutler, F.R.I.B.A., Architect.

C. E. HALLOWS
1902




Kings Walden Herts
New Stabling for T. F. Harrison Esq
Beeston & Burmester Architects

Scale of Feet
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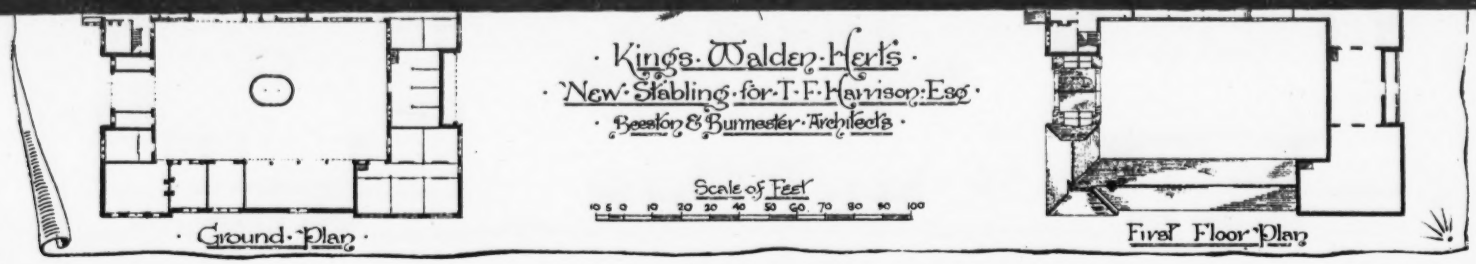
Kings Walden Herts
New Stabling for T F Harrison Esq
Beeston & Burmester Architects
Scale of Feet
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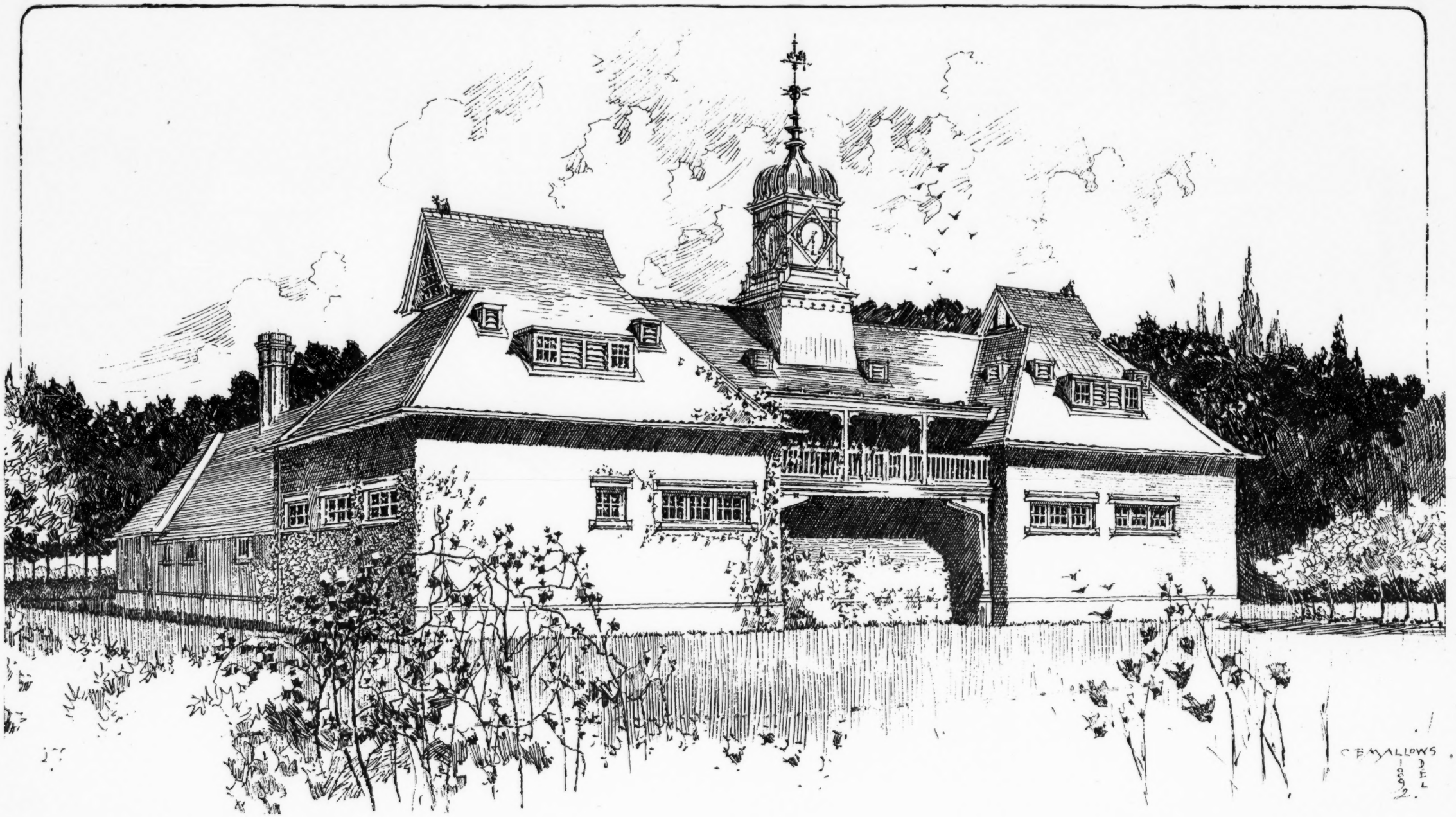
Ground Plan
First Floor Plan

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4

SCULPTURE AT THE CHICAGO EXH

1. The Group "Columbia," East Entrance of Machinery Hall.—Mr. A. Waagen, Sculptor. 2. "Europe": Group from Agricultural Building.—Mr. Philip Ma

4. "Locomotive" Group: from Transportation Building.—Mr. John J. Boyle, Sculptor. 5. Statue o

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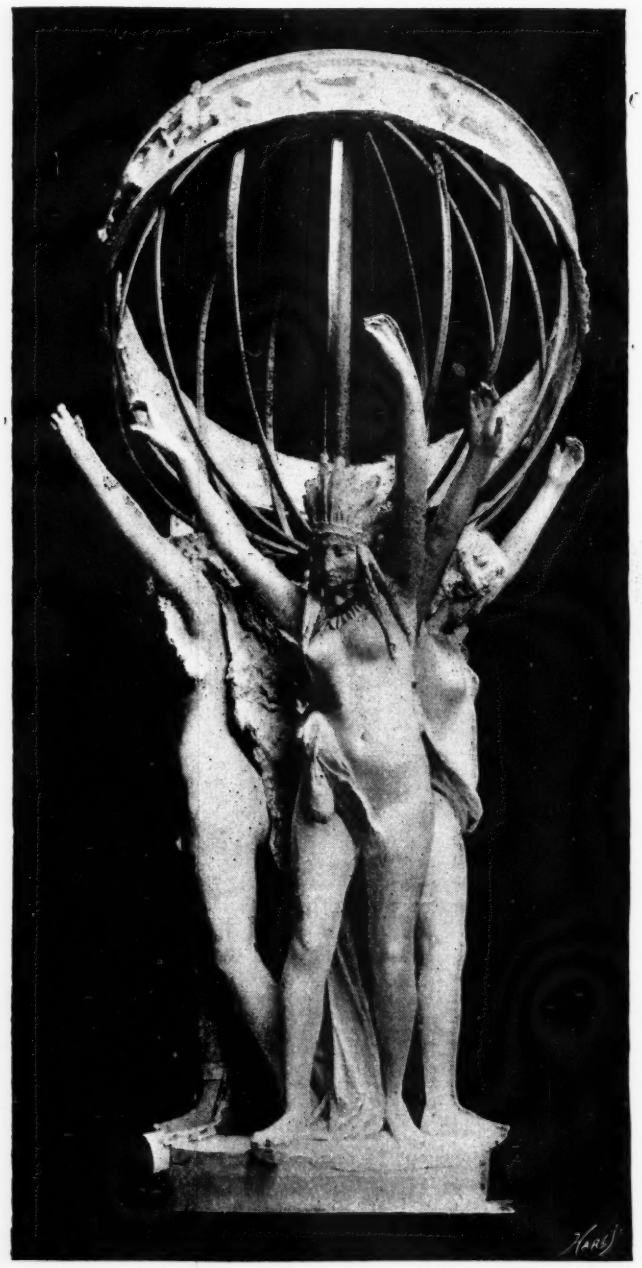

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THE CHICAGO EXHIBITION.

n Agricultural Building.—Mr. Philip Martiny, Sculptor.

or.

3. "America": Group from Agricultural Building.—Mr. Philip Martiny, Sculptor.

5. Statue of "The Republic" (65 ft. high).—Mr. Daniel C. French, Sculptor.